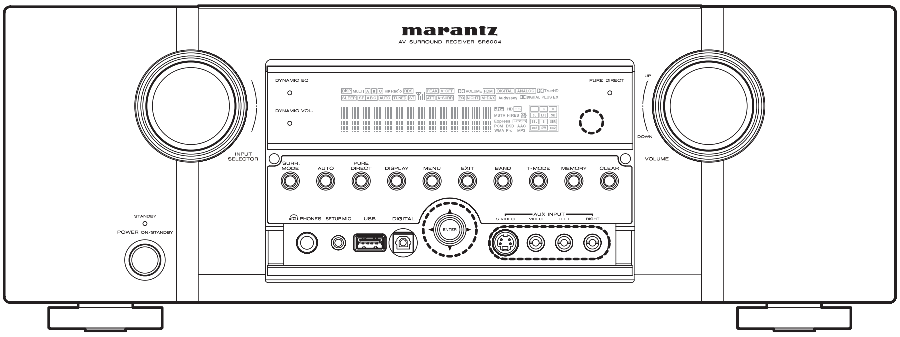
Service Manual

SR6004 /FB/N1B/U1B
/K1SG/N1SG

AV Surround Receiver



SR6004

TABLE OF CONTENTS

Please use this service manual with referring to the user guide (D.F.U.) without fail.
修理の際は、必ず取扱説明書を準備し操作方法を確認の上作業を行ってください。

marantz®

SR6004

Ver. 2

Please refer to MODIFICATION NOTICE.

X0435V02DM/DG0911

Part no. 90M27DW855020
First Issue 2009.11

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS :

Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order :

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature : any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

USA

MARANTZ AMERICA, INC
100 CORPORATE DRIVE
MAHWAH, NEW JERSEY 07430
USA

EUROPE / TRADING

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MARKHAM, ONTARIO L3R 5B1
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CHINA

D&M SALES AND MARKETING SHANGHAI LTD.
ROOM.808 SHANGHAI AIRPORT CITY TERMINAL
NO.1600 NANJING (WEST) ROAD, SHANGHAI,
CHINA. 200040
TEL : 021 - 6248 - 5151
FAX : 021 - 6248 - 4434

NOTE ON SAFETY :

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

安全上の注意：

⚠がついている部品は、安全上重要な部品です。必ず指定されている部品番号のものを使用して下さい。

SHOCK, FIRE HAZARD SERVICE TEST :

CAUTION : After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard No. 60065.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

1. TECHNICAL SPECIFICATIONS ⚠2

FM TUNER SECTION

Frequency Range .... 87.5 - 108.0 MHz [/U, /N, /K]
.... 76.0 - 90.0 MHz [/F]
Usable Sensitivity................................ IHF 1.8 μV/16.4 dBf
Signal to Noise Ratio .... Mono/Stereo 75/70 dB
Distortion... Mono/Stereo 0.2/0.3 %

AM TUNER SECTION

Frequency Range .... 520 - 1710 kHz [/U]
....531 - 1602 kHz [/F, /N, /K]
Signal to Noise Ratio ....50 dB
Usable Sensitivity....................................... Loop 400 μV/m
Distortion..................................... 400Hz, 30 % Mod. 0.5 %

AUDIO SECTION

Power Output (8Ω/20Hz-20kHz/THD=0.08%)
Front L&R....................................... 110 W / Ch [/U, /N, /F]
.... 100 W / Ch [/K]
Center .... 110 W / Ch [/U, /N, /F]
.... 100 W / Ch [/K]
Surround L&R .... 110 W / Ch [/U, /N, /F]
.... 100 W / Ch [/K]
Surround Back L&R .... 110 W / Ch [/U, /N, /F]
.... 100 W / Ch [/K]

Power Output (6Ω/20Hz-20kHz/THD=0.08%) [/U, /N]
Power Output (6Ω/JEITA) [/F, /K]
Front L&R.. 130 W / Ch [/U, /N]
.... 160 W / Ch [/F, /K]
Center .... 130 W / Ch [/U, /N]
.... 160 W / Ch [/F, /K]
Surround L&R .... 130 W / Ch [/U, /N]
.... 160 W / Ch [/F, /K]
Surround Back L&R .... 130 W / Ch [/U, /N]
.... 160 W / Ch [/F, /K]

Input Sensitivity/Impedance .... 180 mV/ 47 Kohms
Signal to Noise Ratio(Analog Input / Pure Direct)..... 105 dB
Frequency Response
(Analog Input / Pure Direct) .... 8 Hz - 100 kHz (± 3 dB)
(Digital Input / 96 kHz PCM) .... 8 Hz - 45 kHz (± 3 dB)

VIDEO

Television Format ....NTSC [/F, /U]
....NTSC/PAL [/N, /K]
Input Level/Impedance................................1 Vp-p/75 ohms
Output Level/Impedance.............................1 Vp-p/75 ohms
Video Frequency Response............. 5 Hz to 8 MHz (-1 dB)
Video Frequency (Component)....... 5 Hz to 80 MHz (-1 dB)
S/N ....60 dB

HDMI

Input / Output jacks .... 19-pin HDMI terminals
(HDMI V.1.3 with Deep Color, Dolby True HD, DTS-HD Master Audio, SACD, DVD-Audio)

GENERAL

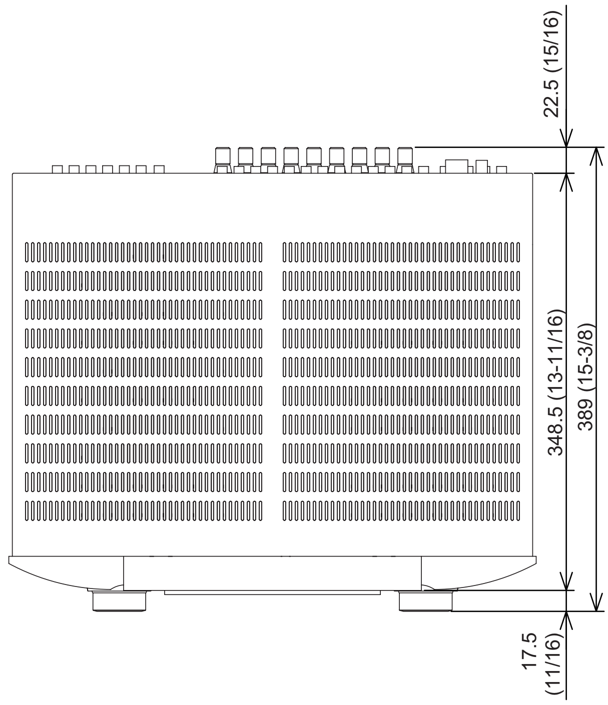
Power Requirement .... AC 100 V 50/60Hz [/F]
.... AC 220 V 50 Hz [/K]
.... AC 230 V 50/60 Hz [/N]
.... AC 120 V 60 Hz [/U]
Power Consumption...650 W
Standby Power Consumption ....(Normal) 0.7 W
.... (Economy) 0.4 W
Weight.. 13.3 kg

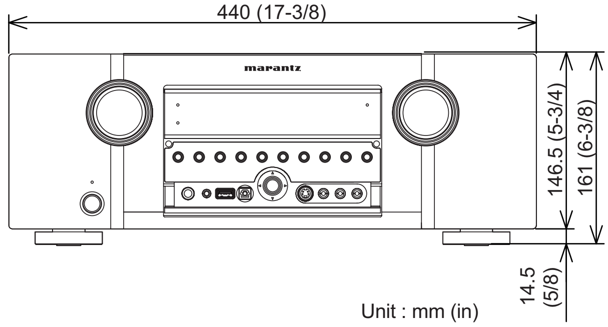
Specifications subject to change without prior notice.

ACCESSORIES

Remote controller (RC007SR)... 1
AAA-size batteries 2
AC power cable.. 1
AM loop antenna.. 1
FM antenna.. 1
Microphone 1
Wireless receiver RX101 1
(Please refer to RX101 Service Manual for this item.)

DIMENSION





Unit : mm (in)

The relation between the selected surround mode and the input signal

The surround mode is selected with the surround mode buttons on SR6004 or the remote control unit. However, the sound you hear is subject to the relationship between the selected surround mode and input signal. That relationship is as follows;

⚠2

Surround Mode	Input Signal	Decoding	Output Channel						Front information display	
			L/R	C	SL SR	HL HR	SBL SBR	SubW	Signal format indicators	Channel status
AUTO	Dolby Surr.EX	Dolby Digital EX	○	○	○	–	○	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1	○	○	○	–	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Dolby Digital 2.0	○	–	–	–	–	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Pro Logic IIx movie	○	○	○	–	○	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	DolbyDigital +	○	–	–	–	–	○	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	DolbyDigital +	○	○	○	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	DolbyDigital +	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, S, LFE (,ex1)
	Dolby Digital Plus (7.1ch)	DolbyDigital +	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (2ch)	DolbyTrueHD	○	–	–	–	–	○	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	DolbyTrueHD	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	Dolby TrueHD (6.1ch)	DolbyTrueHD	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	Dolby TrueHD (7.1ch)	DolbyTrueHD	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	Dolby TrueHD 192kHz (5.1ch)	DolbyTrueHD	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE
	DTS-ES	DTS-ES	○	○	○	–	○	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	DTS-96/24	○	○	○	–	–	○	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	DTS 5.1	○	○	○	–	–	○	dts	L, C, R, SL, SR, LFE
	DTS-HD (2ch)	DTS-HD	○	–	–	–	–	○	dts-HD MSTR/HIRES	L, R
	DTS-HD (5.1ch)	DTS-HD	○	○	○	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	DTS Express	DTS EXPRESS	○	○	○	–	–	○	dts express	L, C, R, SL, SR, LFE
	AAC (5.1ch)	AAC 5.1	○	○	○	–	–	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	AAC 2.0	○	–	–	–	–	○	AAC	L, R
	Multi Ch-PCM (5.1ch)	Multi Ch-PCM	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 96kHz (5.1ch)	Multi Ch-PCM 96kHz	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 192kHz (5.1ch)	Multi Ch-PCM 192kHz	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	SA-CD (5.1ch)	○	○	○	–	–	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	SA-CD (Stereo)	○	–	–	–	–	○	DSD	L, R
	PCM (Audio)	PCM (Stereo)	○	–	–	–	–	○	PCM	L, R
	PCM 96kHz	PCM (Stereo 96kHz)	○	–	–	–	–	○	PCM	L, R
	HDCD	HDCD	○	–	–	–	–	○	PCM, HDCD	L, R
	Analog	Stereo	○	–	–	–	–	○	ANALOG	-
SOURCE DIRECT PURE DIRECT	Dolby Surr.EX	Dolby Digital EX	○	○	○	–	○	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1	○	○	○	–	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Dolby Digital 2.0	○	–	–	–	–	–	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Pro Logic IIx movie	○	○	○	–	○	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	DolbyDigital +	○	–	–	–	–	–	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	DolbyDigital +	○	○	○	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	DolbyDigital +	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, S, LFE (,ex1)
	Dolby Digital Plus (7.1ch)	DolbyDigital +	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (2ch)	DolbyTrueHD	○	–	–	–	–	–	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	DolbyTrueHD	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	Dolby TrueHD (6.1ch)	DolbyTrueHD	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	Dolby TrueHD (7.1ch)	DolbyTrueHD	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	Dolby TrueHD 192kHz (5.1ch)	DolbyTrueHD	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE
	DTS-ES	DTS-ES	○	○	○	–	○	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	DTS-96/24	○	○	○	–	–	○	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	DTS 5.1	○	○	○	–	–	○	dts	L, C, R, SL, SR, LFE
	DTS-HD (2ch)	DTS-HD	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, R
	DTS-HD (5.1ch)	DTS-HD	○	○	○	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	DTS Express	DTS EXPRESS	○	○	○	–	–	○	dts express	L, C, R, SL, SR, LFE
	AAC (5.1ch)	AAC 5.1	○	○	○	–	–	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	AAC 2.0	○	–	–	–	–	–	AAC	L, R

2

Surround Mode	Input Signal	Decoding	Output Channel L/R	C	SL SR	HL HR	SBL SBR	SubW	Front information display: Signal format indicators	Channel status
SOURCE DIRECT PURE DIRECT	Multi Ch-PCM (5.1ch)	Multi Ch-PCM	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 96kHz (5.1ch)	Multi Ch-PCM 96kHz	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 192kHz (5.1ch)	Multi Ch-PCM 192kHz	○	○	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	SA-CD (5.1ch)	○	○	○	–	–	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	SA-CD (Stereo)	○	–	–	–	–	–	DSD	L, R
	PCM (Audio)	PCM (Stereo)	○	–	–	–	–	–	PCM	L, R
	PCM 96kHz	PCM (Stereo 96kHz)	○	–	–	–	–	–	PCM	L, R
	HDCD	HDCD	○	–	–	–	–	–	PCM, HDCD	L, R
	Analog	Stereo	○	–	–	–	–	–	ANALOG	-
	7.1ch input	Multi Ch	○	○	○	–	○	○	ANALOG	-
EX/ES	Dolby Surr.EX	Dolby Digital EX	○	○	○	–	○	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital EX	○	○	○	–	○	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby Digital Plus (5.1ch)	DolbyDigital + +EX	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby TrueHD (5.1ch)	DolbyTrueHD +EX	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-ES	DTS-ES	○	○	○	–	○	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS (5.1ch)	DTS-ES	○	○	○	–	○	○	dts	L, C, R, SL, SR, LFE
	DTS-HD (5.1ch)	DTS-HD + NEO6	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	AAC (5.1ch)	AAC + Dolby EX	○	○	○	–	○	○	AAC	L, C, R, SL, SR, LFE
	Multi-PCM (5.1ch)	Multi Ch-PCM + Dolby Digital EX	○	○	○	–	○	○	PCM	L, C, R, SL, SR, SW
	SA-CD (5.1ch)	SA-CD (5.1ch) + Dolby Digital EX	○	○	○	–	○	○	DSD	L, C, R, SL, SR, SW
DOLBY PLIIz	Dolby Surr.EX	Dolby Digital 5.1 + PLIIz	○	○	○	○	–	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1+ + PLIIz	○	○	○	○	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	PLIIz	○	○	○	○	–	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	PLIIz	○	○	○	○	–	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	PLIIz	○	○	○	○	–	○	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	DolbyDigital Plus + PLIIz	○	○	○	○	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	DolbyDigital Plus + PLIIz	○	○	○	○	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, S,LFE
	Dolby Digital Plus (7.1ch)	DolbyDigital Plus + PLIIz	○	○	○	○	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (2ch)	PLIIz	○	○	○	○	–	○	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	DolbyTrueHD + PLIIz	○	○	○	○	–	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	Dolby TrueHD (6.1ch)	DolbyTrueHD + PLIIz	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	Dolby TrueHD (7.1ch)	DolbyTrueHD + PLIIz	○	○	○	○	–	○	DD TrueHD	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	DTS-HD (2ch)	PLIIz	○	○	○	○	–	○	dts-HD MSTR/HIRES	L, R
	AAC (5.1ch)	AAC + PLIIz	○	○	○	○	–	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Pro Logic IIz	○	○	○	○	–	○	AAC	L, R
	Multi Ch-PCM (5.1ch)	Multi Ch-PCM + PLIIz	○	○	○	○	–	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	SA-CD (5.1ch) + PLIIz	○	○	○	○	–	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	PLIIz	○	○	○	○	–	○	DSD	L, R
	PCM (Audio)	PLIIz	○	○	○	○	–	○	PCM	L, R
	HDCD	PLIIz	○	○	○	○	–	○	PCM, HDCD	L, R
	Analog	PLIIz	○	○	○	○	–	○	ANALOG	–
DOLBY (PLIIx movie) (PLIIx music) (PLIIx game)	Dolby Surr.EX	Dolby Digital EX	○	○	○	–	–	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1	○	○	○	–	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1 + PLIIx	○	○	○	–	○	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Pro Logic IIx	○	○	○	–	○	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Pro Logic IIx	○	○	○	–	○	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	Pro Logic IIx	○	○	○	–	○	○	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	DolbyDigital +	○	○	○	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (5.1ch)	Dolby Digital Plus + PLIIx	○	○	○	–	○	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby TrueHD (2ch)	Pro Logic IIx	○	○	○	–	○	○	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	DolbyTrueHD + PLIIx	○	○	○	–	○	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	Dolby TrueHD (5.1ch)	DolbyTrueHD	○	○	○	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (2ch)	DTS-HD	○	○	○	–	○	○	DD TrueHD	L, R
	AAC (5.1ch)	AAC + PLIIx	○	○	○	–	○	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Pro Logic IIx	○	○	○	–	○	○	AAC	L, R
	Multi Ch-PCM (5.1ch)	Multi Ch-PCM + PLIIx	○	○	○	–	○	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	SA-CD (5.1ch) + PLIIx	○	○	○	–	○	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	Pro Logic IIx	○	○	○	–	○	○	DSD	L, R
	PCM (Audio)	Pro Logic IIx	○	○	○	–	○	○	PCM	L, R
	HDCD	Pro Logic IIx	○	○	○	–	○	○	PCM, HDCD	L, R
	Analog	Pro Logic IIx	○	○	○	–	○	○	ANALOG	-

△2

Surround Mode	Input Signal	Decoding	Output Channel						Front information display	
			L/R	C	SL SR	HL HR	SBL SBR	SubW	Signal format indicators	Channel status
DTS (Neo:6 Cinema) (Neo:6 Music)	DTS-ES	DTS 5.1	○	○	○	–	–	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	DTS-96/24	○	○	○	–	–	○	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	DTS 5.1	○	○	○	–	–	○	dts	L, C, R, SL, SR, LFE
	DTS-HD (2ch)	Neo:6	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, R
	DTS-HD (5.1ch)	DTS-HD	○	○	○	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	DTS-HD	○	○	○	–	○	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	Dolby D (2ch)	Neo:6	○	○	○	–	○	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Neo:6	○	○	○	–	○	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	Neo:6	○	○	○	–	○	○	DD DIGITAL PLUS	L, R
	Dolby TrueHD (2ch)	Neo:6	○	○	○	–	○	○	DD TrueHD	L, R
	AAC (2ch)	Neo:6	○	○	○	–	○	○	AAC	L, R
	SA-CD (2ch)	Neo:6	○	○	○	–	○	○	DSD	L, R
	PCM (Audio)	Neo:6	○	○	○	–	○	○	PCM	L, R
	HDCD	Neo:6	○	○	○	–	○	○	PCM, HDCD	L, R
	Analog	Neo:6	○	○	○	–	○	○	ANALOG	-
CSII (Cinema /Music / Mono)	Dolby D (2ch)	CSII	○	○	○	–	○	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	CSII	○	○	○	–	○	○	DD DIGITAL	L, R, S
	AAC (2ch)	CSII	○	○	○	–	○	○	AAC	L, R
	SA-CD (2ch)	CSII	○	○	○	–	○	○	DSD	L, R
	PCM (Audio)	CSII	○	○	○	–	○	○	PCM	L, R
	HDCD	CSII	○	○	○	–	○	○	PCM, HDCD	L, R
	Analog	CSII	○	○	○	–	○	○	ANALOG	-
NEURAL	Dolby D (2ch)	NEURAL	○	○	○	–	○	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	NEURAL	○	○	○	–	○	○	DD DIGITAL	L, R, S
	AAC (2ch)	NEURAL	○	○	○	–	○	○	AAC	L, R
	SA-CD (2ch)	NEURAL	○	○	○	–	○	○	DSD	L, R
	PCM (Audio)	NEURAL	○	○	○	–	○	○	PCM	L, R
	HDCD	NEURAL	○	○	○	–	○	○	PCM, HDCD	L, R
	Analog	NEURAL	○	○	○	–	○	○	ANALOG	-
STEREO	Dolby Surr.EX	Stereo	○	–	–	–	–	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Stereo	○	–	–	–	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Stereo	○	–	–	–	–	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Stereo	○	–	–	–	–	○	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	Stereo	○	–	–	–	–	○	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	Stereo	○	–	–	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	Stereo	○	–	–	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, S, LFE (,ex1)
	Dolby Digital Plus (7.1ch)	Stereo	○	–	–	–	–	○	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (2ch)	Stereo	○	–	–	–	–	○	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	Stereo	○	–	–	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE (,ex1,ex2)
	Dolby TrueHD (6.1ch)	Stereo	○	–	–	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE
	Dolby TrueHD (7.1ch)	Stereo	○	–	–	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE
	Dolby TrueHD 192kHz(5.1ch)	Stereo	○	–	–	–	–	○	DD TrueHD	L, C, R, SL, SR, LFE
	DTS-ES	Stereo	○	–	–	–	–	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	Stereo	○	–	–	–	–	○	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	Stereo	○	–	–	–	–	○	dts	L, C, R, SL, SR, LFE
	DTS-HD (2ch)	Stereo	○	–	–	–	–	○	dts-HD MSTR/HIRES	L, R
	DTS-HD (5.1ch)	Stereo	○	–	–	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	Stereo	○	–	–	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	Stereo	○	–	–	–	–	○	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	DTS Express	Stereo	○	–	–	–	–	○	dts express	L, C, R, SL, SR, LFE
	AAC (5.1ch)	Stereo	○	–	–	–	–	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Stereo	○	–	–	–	–	○	AAC	L, R
	Multi Ch-PCM	Stereo	○	–	–	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 96kHz (5.1ch)	Stereo	○	–	–	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 192kHz (5.1ch)	Stereo	○	–	–	–	–	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	Stereo	○	–	–	–	–	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	Stereo	○	–	–	–	–	○	DSD	L, R
	PCM (Audio)	Stereo	○	–	–	–	–	○	PCM	L, R
	PCM 96kHz	Stereo	○	–	–	–	–	○	PCM	L, R
	HDCD	Stereo	○	–	–	–	–	○	PCM, HDCD	L, R
	Analog	Stereo	○	–	–	–	–	○	ANALOG	-
Dolby Virtual Speaker	Dolby Surr.EX	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL	L, R
	Dolby D (2ch Surr)	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL	L, R, S
	Dolby Digital Plus (2ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL PLUS	L, R
	Dolby Digital Plus (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, S, LFE (,ex1)
	Dolby Digital Plus (7.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (2ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD TrueHD	L, R
	Dolby TrueHD (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD TrueHD	L, C, R, SL, SR, LFE

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Surround Mode	Input Signal	Decoding	Output Channel						Front information display	
			L/R	C	SL SR	HL HR	SBL SBR	SubW	Signal format indicators	Channel status
Dolby Virtual Speaker	Dolby TrueHD (6.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD TrueHD	L, C, R, SL, SR, LFE
	Dolby TrueHD (7.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DD TrueHD	L, C, R, SL, SR, LFE
	DTS-ES	Dolby Virtual Speaker	○	–	–	–	–	–	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	Dolby Virtual Speaker	○	–	–	–	–	–	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	dts	L, C, R, SL, SR, LFE
	DTS-HD (2ch)	Dolby Virtual Speaker	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, R
	DTS-HD (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	AAC (5.1ch)	Virtual	○	–	–	–	–	–	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Virtual	○	–	–	–	–	–	AAC	L, R
	Multi Ch-PCM (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	Dolby Virtual Speaker	○	–	–	–	–	–	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	DSD	L, R
	PCM (Audio)	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	PCM	L, R
	HDCD	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	PCM, HDCD	L, R
	Analog	PLII+ Dolby Virtual Speaker	○	–	–	–	–	–	ANALOG	-
Multi Ch. Movie Music	Dolby Surr.EX	Dolby Digital EX	○	(○)	○	–	○	○	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby Digital 5.1	○	(○)	○	–	–	○	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Multi Channel	○	(○)	○	–	○	○	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Multi Channel	○	(○)	○	–	○	○	DD DIGITAL	L, R, S
	DTS-ES	DTS-ES	○	(○)	○	–	○	○	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	DTS-96/24	○	(○)	○	–	–	○	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	DTS 5.1	○	(○)	○	–	–	○	dts	L, C, R, SL, SR, LFE
	AAC (5.1ch)	AAC 5.1	○	○	○	–	–	○	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Multi Channel Stereo	○	○	○	○	○	○	AAC	L, R
	Multi Ch-PCM	Multi Ch-PCM	○	(○)	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	Multi Ch-PCM 96kHz	Multi Ch-PCM 96kHz	○	(○)	○	–	–	○	PCM	L, C, R, SL, SR, LFE
	SA-CD (5.1ch)	SA-CD (5.1ch)	○	(○)	○	–	–	○	DSD	L, C, R, SL, SR, LFE
	SA-CD (2ch)	Multi Channel	○	(○)	○	–	○	○	DSD	L, R
	PCM (Audio)	Multi Channel	○	(○)	○	–	○	○	PCM	L, R
(○): Movie mode	HDCD	Multi Channel	○	(○)	○	–	○	○	PCM, HDCD	L, R
only.	Analog	Multi Channel	○	(○)	○	–	○	○	ANALOG	-
Headphone (DolbyHP or Normal Headphone)	Dolby Surr.EX	Dolby H.P	○	–	–	–	–	–	DD DIGITAL EX	L, C, R, SL, SR, S, LFE
	Dolby D (5.1ch)	Dolby H.P	○	–	–	–	–	–	DD DIGITAL	L, C, R, SL, SR, LFE
	Dolby D (2ch)	Dolby H.P	○	–	–	–	–	–	DD DIGITAL	L, R
	Dolby D (2ch Surr)	Dolby H.P	○	–	–	–	–	–	DD DIGITAL	L, R, S
	Dolby Digital Plus (5.1ch)	Stereo	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, LFE
	Dolby Digital Plus (6.1ch)	Stereo	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, S, LFE (,ex1)
	Dolby Digital Plus (7.1ch)	Stereo	○	–	–	–	–	–	DD DIGITAL PLUS	L, C, R, SL, SR, SBL, SBR, LFE
	Dolby TrueHD (5.1ch)	Stereo	○	–	–	–	–	–	DD TrueHD	L, R
	Dolby TrueHD (6.1ch)	Stereo	○	–	–	–	–	–	DD TrueHD	L, R
	Dolby TrueHD (7.1ch)	Stereo	○	–	–	–	–	–	DD TrueHD	L, R
	Dolby TrueHD 192kHz(5.1ch)	Stereo	○	–	–	–	–	–	DD TrueHD	L, C, R, SL, SR, LFE
	DTS-ES	Dolby H.P	○	–	–	–	–	–	dts, ES	L, C, R, SL, SR, S, LFE
	DTS 96/24	Dolby H.P	○	–	–	–	–	–	dts 96/24	L, C, R, SL, SR, LFE
	DTS (5.1ch)	Dolby H.P	○	–	–	–	–	–	dts	L, C, R, SL, SR, LFE
	DTS-HD (5.1ch)	Stereo	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, LFE (,ex1,ex2)
	DTS-HD (6.1ch)	Stereo	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, S, LFE (,ex1,ex2)
	DTS-HD (7.1ch)	Stereo	○	–	–	–	–	–	dts-HD MSTR/HIRES	L, C, R, SL, SR, SBL, SBR, LFE (,ex1,ex2)
	DTS Express	Stereo	○	–	–	–	–	–	dts express	L, C, R, SL, SR, LFE
	AAC (5.1ch)	Dolby H.P	○	–	–	–	–	–	AAC	L, C, R, SL, SR, LFE
	AAC (2ch)	Dolby H.P	○	–	–	–	–	–	AAC	L, R
	Multi Ch-PCM (5.1ch)	Dolby H.P	○	–	–	–	–	–	PCM	L, C, R, SL, SR, LFE
	PCM	Dolby H.P	○	–	–	–	–	–	PCM	L, R
	HDCD	Dolby H.P	○	–	–	–	–	–	PCM, HDCD	L, R
	ANALOG	Dolby H.P	○	–	–	–	–	–	ANALOG	L, R

Notes

- *Dolby Digital (2 channel L/R): Speakers for signal with Dolby Surround are fully equipped.*
- *No sound is outputs from the surround speaker, center speaker and subwoofer if the DVD disc has no surround data.*
- *Surround modes other than Stereo are not available during Dolby TrueHD, Dolby Digital Plus, or DTS-HD playback.*
  If surround modes other than Stereo are selected and Dolby TrueHD, Dolby Digital Plus, or DTS-HD content is played, the surround mode setting is disabled.

Abbreviations

L/R : Front speakers
C : Center speaker
SL/SR : Surround speakers
HL/HR : Front height speakers
SBL/SBR : Surround back speakers
SubW : Subwoofer
LFE : Low frequency efects
ex : Extension

AUTO

When this mode is selected, the unit determines whether the digital input signal is Dolby Digital, Dolby Digital Surround EX, Dolby Digital Plus, Dolby TrueHD, DTS-HD, DTS, DTS-ES, DTS 96/24 or PCM audio.
Surround EX & DTS-ES will operate for multichannel sources that have a Dolby Digital Surround EX or DTS-ES auto trigger flag in the digital signal.
When a Dolby Digital or DTS signal is input, the number of channels for which the corresponding signal is encoded will be played.
Inputting a Dolby Digital two channel signal with Dolby surround status automatically subjects that signal to Pro Logic IIx movie processing before play.
PCM 96 kHz source material can be played in this mode.

Notes

- *When you use this mode with certain DVD and CD players, performing operations such as skip or stop may momentarily interrupt the output.*
- *When the signal is not decoded, the mode is changed to AUTO mode automatically. See page 83 to confirm the available decoding modes.*

SOURCE DIRECT

In the Source Direct mode, the tone control circuit Acoustic EQ. and bass management configuration are bypassed for full-range frequency response and the purist audio reproduction.

Notes

- *Speaker size is set to Front L/R = Large, Center = Large, Surround L/R = Large and Subwoofer = Yes automatically. Tone controls, equalizer and additional processing are deactivated.*
- *When you use this mode with certain DVD and CD players, performing operations such as skip or stop may momentarily interrupt the output.*
- *In SOURCE DIRECT mode, ACOUSTIC EQ and M-DAX are not available.*

PURE DIRECT

The Pure Direct mode further reduces sources of noise in addition to effect of the Source Direct mode, by blocking output from the video jacks (VIDEO, S-VIDEO, COMPONENT VIDEO and HDMI) and turning the FL display off.

Note

- *In PURE DIRECT mode, ACOUSTIC EQ and M-DAX are not available.*

EX/ES

This mode provides 6.1 channel surround for Dolby Digital EX, and DTS-ES-encoded source material such as DVD.
This mode cannot be used when an analog input has been selected.

Dolby Digital EX

In a movie theater, film soundtracks that have been encoded with Dolby Digital Surround EX technology are able to reproduce an extra channel which has been added during the mixing of the program.
This channel, called surround back, places sounds behind the listener in addition to the currently available front left, front center, front right, surround right, surround left and subwoofer channels.
This additional channel provides the opportunity for more detailed imaging behind the listener and brings more depth, spacious ambience and sound localization than ever before.
Dolby Digital EX is not available in systems that do not have without surround back speaker(s).

DTS-ES (Discrete 6.1, Matrix 6.1)

DTS-ES adds the surround center channel audio to the DTS 5.1 channel format to improve the acoustic positioning, and makes acoustic image movement more natural with the 6.1 channel reproduction.
This unit incorporates a DTS-ES-decoder, which can handle DTS-ES Discrete-encoded and DTS-ES Matrix-encoded program sources from DVD, etc.
DTS-ES Discrete 6.1 features digital discrete recording of all channels, including the surround back channel(s), and higher quality audio reproduction.
DTS-ES is not available in systems that do not have surround back speakers.

ꓷꓷ MODE

(Dolby Digital, Pro Logic IIx MOVIE, Pro Logic IIx MUSIC, Pro Logic IIx GAME)

This mode is used with source materials encoded in Dolby Digital and Dolby Surround.

DOLBY DIGITAL

This mode is enabled when playing source materials encoded in Dolby Digital.
Playing multichannel-encoded 5.1 channel Dolby Digital sources provides 5 main audio channels (left, center, right, surround left and surround right) and a Low Frequency Effect channel.
Dolby Digital EX decoding is not available in this mode.

Dolby Pro Logic IIx has 5 modes:

Pro Logic IIx MOVIE

This mode provides 6.1 or 7.1 channel surround sound from Dolby Surround, encoded stereo movie soundtracks.

Pro Logic IIx MUSIC

This mode provides 6.1 or 7.1 channel surround sound from conventional stereo sources (analog or digital), such as CD, tape, FM, TV, stereo VCR, etc.

Pro Logic IIx GAME

This mode restores the impact low-frequency surround effects by routing them to the system's subwoofer.

5.1ch + Pro Logic IIx Movie

This mode provides 7.1 channel surround sound from 5.1 channel sources movie soundtracks.

5.1ch + Pro Logic IIx Music

This mode provides 6.1 or 7.1 channel surround sound from 5.1 channel sources music soundtracks.

Notes

- *Pro Logic IIx mode will decode as Pro Logic II mode when the Surr. B is set to "None" from SPEAKER SETUP menu. (See page 28)*
- *Pro Logic IIx mode is available for a 2 channel input signal which is encoded in Dolby Digital, HDCD or PCM format.*

Pro Logic IIz Height

Dolby Pro Logic IIz Height is designed to more effectively use existing program material when height channel speaker outputs are present. Dolby Pro Logic IIz Height can be used to upmix a variety of sources from movies and music, but are particularly well-suited to upmix game content.

dts

dts, Neo:6 Cinema, Neo:6 Music
This mode is for DTS-encoded source materials such as laserdisc, CD and DVD. Neo:6 is for some 2 channel sources.

dts

This mode is enabled when playing source materials encoded in dts multichannel.
Playing multichannel encoded-5.1 channel dts sources provides five main audio channels (left, center, right, surround left and surround right) and a Low Frequency Effects channel.
dts-ES decoding is not available in this mode.
The DTS mode cannot be used when an analog input has been selected.

Neo:6 Cinema, Neo:6 Music

This mode decodes 2 channel signals into 6 channel signals using high-accuracy digital matrix technology. The DTS Neo:6 decoder has near-discrete properties in the frequency characteristics of the channels as well as in channel separation.
According to the signals to be played back, DTS Neo:6 uses either the Neo:6 Cinema mode optimized for movie playback or the Neo:6 Music mode optimized for music playback.

Note

- *The Neo:6 mode is available for 2 channel input signals which are encoded in Dolby Digital, HDCD or PCM format.*

CIRCLE SURROUND II (CSII-CINEMA, CSII-MUSIC, CSII-MONO)

Circle Surround is designed to enable multichannel surround sound playback of non-encoded and multichannel encoded material.
Backward compatibility provides listeners with up to 6.1 channels of surround performance from an entire collection of music and film, including broadcast, videotape and stereo recorded music.
Depending on source material, you can select CSII-Cinema mode, CSII-Music mode or CSII-Mono mode.

Note

- *The CS II mode is available for 2 channel input signals which are encoded in Dolby Digital, HDCD or PCM format.*

STEREO

This mode bypasses all surround processing.
In stereo program sources, the left and right channels play normally when PCM audio or analog stereo is input.
With Dolby Digital and DTS sources, the 5.1 channels are converted to two channel stereo. 96 kHz PCM source material can be played back in stereo mode.

Dolby Virtual Speaker

Dolby Virtual Speaker technology uses proprietary technology of Dolby Laboratories to create a virtual surround sound field using only two speakers for the front channels, allowing the user to experience sound as if surround speakers were actually being used.

MULTI CH. (MOVIE, MUSIC)

This mode is used to create a wider, deeper and more natural soundstage from two channel source material.
This is done by feeding the left channel signal to both the left front and left surround speakers and the right channel signal to both the right front and right surround speakers. Additionally, the center channel reproduces a mix of the right and left channels.

Note

- *Audio is not output from the CENTER channel when using MULTI CH. MUSIC mode.*

Neural Surround

Neural Surround™ represents the latest advancement in surround technology developed for music.
Neural Surround™ employs psychoacoustic frequency domain processing which allows delivery of a more detailed sound stage with superior channel separation and localization of audio elements. System playback is scalable from 5.1 to 7.1 multi-channel surround playback.

CAUTION

Note for DTS

- To connected DVD player, laserdisc player or CD player needs to support DTS digital output. You may not be able to play some DTS source signals from certain CD players and LD players even if you connect the player to the unit digitally. This is because the digital signal has been processed (such as the output level, sampling frequency or frequency response), and the unit cannot recognize the signal as DTS data.
- Depending on the player used, DTS play may produce a short noise. This is not a malfunction.
- While signals from a DTS laserdisc or CD are playing in another surround mode, you cannot switch to digital input or from digital input to analog input from the INPUT SETUP in the MAIN MENU or by pressing the A/D button.
- You can not listen to DTS-encoded software in a multiroom.
- The outputs for VCR OUT, TAPE OUT and CD/CD-R OUT output analog audio signals only. Do not record from CDs or LDs that support DTS using these outputs. If you do, the DTS-encoded signal will be recorded as noise.

Note or Dolby Digital Surround EX

- When playing Dolby Digital Surround EX-encoded software in 6.1 channels, it is required to set the EX/ES mode.
- Note that some Dolby Digital Surround EX-encoded software does not contain the identification signal. In this case, set the EX/ES mode manually.

Note for 96 kHz/192 kHz PCM audio

- The AUTO, Pure Direct, and Stereo modes can be used when playing PCM signals with a sampling frequency of 96/192 kHz (such as from DVD-Video/Audio discs).
- Certain DVD player models inhibit digital output. For details, refer to the player’s operation manual.
- Some DVD discs feature copy protection. When using such disc, 96 kHz PCM signal are not output from the DVD player. For details, refer to the player’s operation manual.

Note for HDCD

- HDCD is effective only through digital input.
- You may not be able to play some HDCD source signals from certain CD players if you connect the player to the unit digitally. This is because the digital signal has been processed (such as the output level, sampling frequency or frequency response) and the unit cannot recognize the signal as HDCD data.

2. TECHNICAL DESCRIPTION

dts Neural Surround

DTS Neural Surround has been chosen as the surround sound format for XM Satellite Radio's "XM HD Surround, " TV sports broadcasting, 7.1 games, Music Direct Internet streaming as well as leading FM/HD radio stations. It delivers the rich envelopment and discrete image detail of surround sound by unmasking the audio details, typically lost by other playback modes audiences will experience the deep ambience and subtle details of movies, music and games.

dts Digital Surround
ES | Neo:6 | 96/24

• dts Digital Surround

DTS was introduced in 1994 to provide 5.1 channels of discrete digital audio into home theater systems.
DTS brings you premium quality discrete multichannel digital sound to both movies and music.
DTS is a multichannel sound system designed to create full range digital sound reproduction.
The no compromise DTS digital process sets the standard of quality for cinema sound by delivering an exact copy of the studio master recordings to neighborhood and home theaters.
Now, every moviegoer can hear the sound exactly as the moviemaker intended.
DTS can be enjoyed in the home for either movies or music on of DVD's, LD's, and CD's.

• dts Neo:6®

The advantages of discrete multichannel systems over matrix are well known.
But even in homes equipped for discrete multichannel, there remains a need for high-quality matrix decoding. This is because of the large library of matrix surround motion pictures available on disc and on VHS tape; and analog television broadcasts.
The typical matrix decoder of today derives a center channel and a mono surround channel from two-channel matrix stereo material. It is better than a simple matrix in that it includes steering logic to improve separation, but because of its mono, band-limited surround it can be disappointing to users accustomed to discrete multichannel.

Neo:6 offers several important improvements as follow,

- Neo:6 provides up to six full-band channels of matrix decoding from stereo matrix material. Users with 6.1 and 5.1 systems will derive six and five separate channels, respectively, corresponding to the standard home-theater speaker layouts.
- Neo:6 technology allows various sound elements within a channel or channels to be steered separately, and in a way which follows naturally from the original presentation.
- Neo:6 offers a music mode to expand stereo nonmatrix recordings into the five- or six-channel layout, in a way which does not diminish the subtlety and integrity of the original stereo recording.

• dts Digital Surround ES®

DTS-ES Extended Surround is a new multichannel digital signal format developed by Digital Theater Systems Inc. While offering high compatibility with the conventional DTS Digital Surround format, DTS-ES Extended Surround greatly improves the 360-degree surround impression and space expression thanks to further expanded surround signals. This format has been used professionally in movie theaters since 1999.

In addition to the 5.1 surround channels (FL, FR, C, SL, SR and LFE), DTS-ES Extended Surround also offers the SB (Surround Back) channel for surround playback with a total of 6.1 channels. DTS-ES Extended Surround includes two signal formats with different surround signal recording methods, as DTS-ES Discrete 6.1 and DTS-ES Matrix 6.1.

• dts Digital Surround 96/24

The stereo CD is a 16-bit medium with sampling at 44.1 kHz. Professional audio has been 20- or 24-bit for some time, and there is increasing interest in higher sampling rates both for recording and for delivery into the home. Greater bit depths provide extended dynamic range. Higher sampling rates allow wider frequency response and the use of anti-alias and reconstruction filters with more favorable aural characteristics.

DTS 96/24 allows for 5.1channel sound tracks to be encoded at a rate of 96kHz/24bits on DVD-Video titles.

When DVD-video appeared, it became possible to deliver 24-bit, 96 kHz audio into the home, but only in two channels, and with serious limitations on picture. This capability has had little use.

DVD-audio allows 96/24 in six channels, but a new player is needed, and only analog outputs are provided, necessitating the use of the D/A converters and analog electronics provided in the player.

DTS 96/24 offers the following:

1. Sound quality transparent to the original 96/24 master.
2. Full backward compatibility with all existing decoders. (Existing decoders will output a 48 kHz signal)
3. No new player required: DTS 96/24 can be carried on DVD-video, or in the video zone of DVD-audio, accessible to all DVD players.
4. 96/24 5.1-channel sound with full-quality full-motion video, for music programs and motion picture soundtracks on DVD-video.

dts-HD™ Master Audio

DTS-HD Master Audio is capable of delivering audio that is a bit-for-bit identical to the studio master. DTS-HD Master Audio delivers audio at super high variable bit rates -24.5 mega-bits per second (Mbps) on Blu-ray discs and 18.0 Mbps on HD-DVD - that are significantly higher than standard DVDs . This bit stream is so "fast" and the transfer rate is so "high" that it can deliver the Holy Grail of audio: 7.1 audio channels at 96k sampling frequency/24 bit depths that are identical to the original. With DTS-HD Master Audio, you will be able to experience movies and music, exactly as the artist intended: clear, pure, and uncompromised.

Manufactured under license under U.S. Patent No's: 5,451,942; 5,956,674; 5,974,380;5,978,762; 6,226,616; 6,487,535, 7,212,872; 7,333,929; 7,392,195; 7,272,567 & other U.S. and worldwide patents issued & pending.

dts-HD™ High Resolution Audio

DTS-HD High Resolution Audio can deliver up to 7.1 channels of sound that is virtually indistinguishable from the original. DTS-HD High Resolution Audio delivers audio at high constant bit rates superior to standard DVDs---6.0 Mbps on Blu-ray discs and 3.0 Mbps on HD-DVD to produce outstanding sound quality. It is capable of delivering up to 7.1 channels at 96k sampling frequency/24 bit depth resolution. It allows content creators to deliver rich, high definition audio on movies where disc space may not allow for DTS-HD Master Audio.

Manufactured under license under U.S. Patent No's: 5,451,942; 5,956,674; 5,974,380; 5,978,762; 6,226,616; 6,487,535, 7,212,872; 7,333,929 & other U.S. and worldwide patents issued & pending.

DTS-EXPRESS is a low-bitrate encoding technology supporting up to 5.1 channels with fixed data transfer rates. This format is incorporated with sub audio on HD DVD and secondary audio on Blu-ray Disc while boasting the potential applicability to upcoming broadcasts and memory audio contents.

Dolby Digital identifies the use of Dolby Digital audio coding for such consumer formats as DVD and DTV. As with film sound, Dolby Digital can provide up to five full-range channels for left, center, and right screen channels, independent left and right surround channels, and a sixth (".1") channel for low-frequency effects.

Dolby Surround Pro Logic II is an improved matrix decoding technology that provides better spatiality and directionality on Dolby Surround program material; provides a convincing three-dimensional soundfield on conventional stereo music recordings; and is ideally suited to bring the surround experience to automotive sound. While conventional surround programming is fully compatible with Dolby Surround Pro Logic II decoders, soundtracks will be able to be encoded specifically to take full advantage of Pro Logic II playback, including separate left and right surround channels. (Such material is also compatible with conventional Pro Logic decoders.)

Dolby Digital EX creates six full-bandwidth output channels from 5.1-channel sources. This is done using a matrix decoder that derives three surround channels from the two in the original recording. For best results, Dolby Digital EX should be used with movies soundtracks recorded with Dolby Digital Surround EX.

About Dolby Pro Logic IIx

Dolby Pro Logic IIx technology delivers a natural and immersing 7.1-channel listening experience to the home theater environment. A product of Dolby's expertise in surround sound and matrix decoding technologies, Dolby Pro Logic IIx is a complete surround sound solution that maximizes the entertainment experience from stereo as well as 5.1-channel encoded sources.

Dolby Pro Logic IIx is fully compatible with Dolby Surround Pro Logic technology and can optimally decode the thousands of commercially available Dolby Surround encoded video cassettes and television programs with enhanced depth and spatiality. It can also process any high-quality stereo or Advanced Resolution 5.1-channel music content into a seamless 6.1- or 7.1-channel listening experience.

Dolby Pro Logic IIz Height is designed to more effectively use existing program material when height channel speaker outputs are present. Dolby Pro Logic IIz Height can be used to upmix a variety of sources from movies and music, but are particularly well-suited to upmix game content.

The Dolby Headphone technology provides a surround sound listening experience over headphones.
When listening to multichannel content such as DVD movies over headphones, the listening experience is fundamentally different than listening to speakers. Since the headphone speaker drivers are covering the pinna of the ear, the listening experience differs greatly from traditional speaker playback. Dolby utilizes patented headphone perspective curves to solve this problem and provides a non-fatiguing, immersive, home theater listening experience. Dolby Headphone also delivers exceptional 3D audio from stereo material.

DOLBY VIRTUAL SPEAKER

Dolby Virtual Speaker is a technologycertified by Dolby Laboratories that creates a virtualized surround sound experience from two speakers using a multichannel Dolby Digital source. Additionally, Dolby Virtual Speaker can simulate the surround sound effect produced by Dolby Pro Logic or Dolby Pro Logic II.
Dolby Virtual Speaker retains all the original Multichannel audio information and provides the listener with the sensation of being surrounded by additional speakers.

DOLBY TRUEHD

Dolby® TrueHD is Dolby's next-generation lossless technology developed for high-definition disc-based media. Dolby TrueHD delivers tantalizing sound that is bit-for-bit identical to the studio master, unlocking the true high-definition entertainment experience on next-generation discs. When coupled with high-definition video, Dolby TrueHD offers an unprecedented home theater experience that lets you enjoy sound as stunning as the high-definition picture.

DOLBY DIGITAL PLUS

Dolby Digital Plus is a highly sophisticated and versatile audio codec based on Dolby Digital and designed specifically to adapt to the changing demands of future audio, video delivery, and audio storage systems while simultaneously retaining backwards compatibility with the existing Dolby Digital 5.1-channel home theater systems in use today.

Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic", "Surround EX", and the double-D symbol are trademarks of Dolby Laboratories.

SRS Circle Surround II

Circle Surround II® (CS-II) is a powerful and versatile multichannel technology. CS-II is designed to enable up to 6.1 multichannel surround sound playback from mono, stereo, CS encoded sources and other matrix encoded sources. In all cases the decoder extends it into 6 channels of surround audio and a LFE/subwoofer signal. The CS-II decoder creates a listening environment that places the listener "inside" music performances and dramatically improves both hi-fi audio conventional surround-encoded video material. CS-II provides composite stereo rear channels to greatly improve separation and image positioning– adding a heightened sense of realism to both audio and A/V productions.
CS-II is packed with other useful feature like dialog clarity (SRS Dialog) for movies and cinema-like bass enrichment (TruBass). CS-II can enable the dialog to become clearer and more discernable in movies and it enables the bass frequencies contained in the original programming to more closely achieve low frequencies–overcoming the low frequency limitations of the speakers by full octave.

Circle Surround II, SRS and (●) symbol are trademarks of SRS Labs, Inc.
Circle Surround II technology is incorporated under license from SRS Labs, Inc.

HDCD® (High Definition Compatible Digital®) is a patented process for delivering on Compact Disc the full richness and details of the original microphone feed.
HDCD encoded CDs sound better because they are encoded with 20-bits of real musical information as compared to 16-bits for all other CDs.
HDCD overcomes the limitation of the 16-bit CD format by using a sophisticated system to encode the additional four bits onto the CD while remaining completely compatible with the CD format.
When listening to HDCD recordings, you hear more dynamic range, a focused 3-D sound stage, and extremely natural vocal and musical timbre. With HDCD, you get the body, depth and emotion of the original performance not a flat, digital imitation.
HDCD system manufactured under license from Microsoft. This product is covered by one or more of the following: In the United States 5,479,168 5,638,074 5,640,161 5,808,574 5,838,274 5,854,600 5,864,311 5,872,531 and in Australia 669,114 with other patents pending.

HDMI, the HDMI and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

Macrovision

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

MultEQ®

Audyssey MultEQ is a room equalization solution that calibrates any audio system so that it can achieve optimum performance for every listener in a large listening area. MultEQ captures acoustical information at multiple locations throughout a listening area in both the time and frequency domains. It uses a sophisticated clustering algorithm to combine this information so that acoustical problems are accurately analyzed. Based on these measurements, MultEQ calculates an equalization solution that corrects for both time and frequency response problems in the listening area and also performs a fully automated surround system setup. The result is clear, well-balanced sound for every listener.

Dynamic EQ™

Audyssey Dynamic EQ solves the problem of deteriorating sound quality as volume is decreased by taking into account human perception and room acoustics. Dynamic EQ selects the correct frequency response and surround levels moment-by-moment at any userselected volume setting. The result is bass response, tonal balance and surround impression that remain constant despite changes in volume. Dynamic EQ combines information from incoming source levels with actual output sound levels in the room, a prerequisite for delivering a loudness correction solution. Audyssey Dynamic EQ works in tandem with Audyssey MultEQ to provide well-balanced sound for every listener at any volume level.

Dynamic Volume™

Audyssey Dynamic Volume solves the problem of large variations in volume level between television programs, commercials, and between the soft and loud passages of movies.
Dynamic Volume looks at the preferred volume setting by the user and then monitors how the volume of program material is being perceived by listeners in real time to decide whether an adjustment is needed. Whenever necessary, Dynamic Volume makes the necessary rapid or gradual adjustments to maintain the desired playback volume level while

optimizing the dynamic range. Audyssey Dynamic EQ is integrated into Dynamic Volume so that as the playback volume is adjusted automatically, the perceived bass response, tonal balance, surround impression, and dialog clarity remain the same whether watching movies, flipping between television channels, or changing from stereo to surround sound content.

Manufactured under license from Audyssey Laboratories. U.S. and foreign patents pending. Audyssey MultEQ®, Audyssey Dynamic Volume™, and Audyssey Dynamic EQ™ are registered trademark of Audyssey Laboratories.

- "Made for iPod" means that an electronic accessory has been designed to connect specifically to iPod and has been certified by the developer to meet Apple performance standards.
  "Works with iPhone" means that an electronic accessory has been designed to connect specifically to iPhone and has been certified by the developer to meet Apple performance standards.
  Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards.

iPod is a trademark of Apple Inc. registered in the US and other countries. iPhone is a trademark of Apple Inc.

SIRIUS, XM Satellite Radio Ready

SIRIUS, XM and all related marks and logos are trademarks of Sirius XM Radio Inc. and its subsidiaries. All rights reserved. **Service not available in Alaska and Hawaii.**

XM HD Surround uses Neural Surround™ technology to achieve optimal surround sound from XM radio.

エーエーシー　アドバンスド　オーディオ　コーディング

AAC（Advanced Audio Coding）

BS デジタル放送および地上波デジタル放送が採用している音声方式で、MPEG2 規格のひとつです。高圧縮率と高音質が特長で、2CH ステレオ音声に加え、5.1CH サラウンド音声や多言語放送を可能にしています。以下はパテントナンバーです。

5848391	5,291,557	5,451,954
5,357,594	5 752 225	5,394,473
5,633,981	5 297 236	4,914,701
5,579,430	08/678,666	98/03037
98/03036	5,227,788	5,285,498
5,781,888	08/039,478	08/211,547
08/894,844	5,299,238	5,299,239
5,490,170	5,264,846	5,268,685
5,548,574	5,717,821	08/937,950
08/576,495	08/392,756	

5 400 433	5,222,189
5,583,962	5,274,740
5,235,671	07/640,550
97/02875	97/02874
5,481,614	5,592,584
5,703,999	08/557,046
5,299,240	5,197,087
5,375,189	5,581,654
05-183,988	08/506,729

3. POWER AMPLIFIER ADJUSTMENT

Idling Current Alignment

1. Each of the measurement points are provided with the two test points. Set a digital Voltage meter to DC voltage input, connect the meter to the test points at both contact points.
2. After the setup above, turn on the main switch.
3. Adjust variable resistors (VR60 - VR66) according to the digital voltmeter readings. The target setting value is the following table for each channels.

アイドリング電流調整

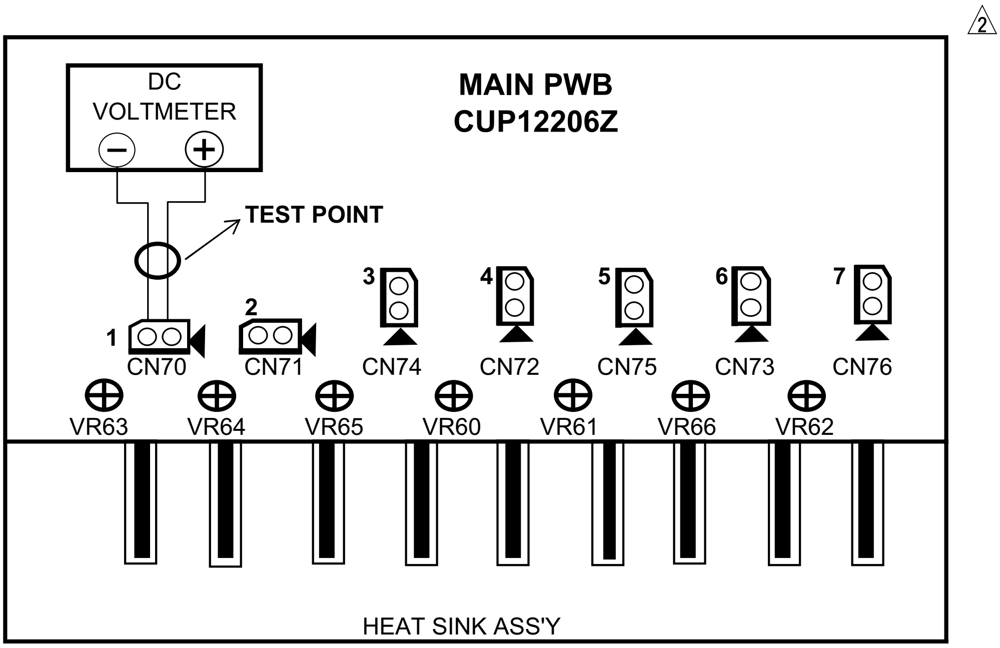
1. 電源を ON する前にそれぞれの "+" 端子と "-" 端子間にデジタルボルトメーターを接続します。デジタルボルトメーターを DC 電圧入力にセットします。
2. 上記のセットアップの後に、本機の電源を ON します。
3. デジタルボルトメーターの電圧値を監視しながら可変抵抗器 (VR60 ～ VR66) を調節します。
各チャンネルの目標値は下記の表を参照下さい。

Settings :

Master Volume- - - - Minimum
Speaker out - - - - - No Load
Top lid- - - - - - - - - - OPEN

セッティング :

マスター・ボリューム - - - - 最小
スピーカー接続 - - - - - - - - - 無し
トップカバー - - - - - - - - - - 無し



DC voltmeter

NO.	Channel	Measurement Point	Alignment point
1	Surround Right	CN70	VR63
2	Surround Left	CN71	VR64
3	Center	CN74	VR65
4	Front Left	CN72	VR60
5	Surround Back Left	CN75	VR61
6	Front Right	CN73	VR66
7	Surround Back Right	CN76	VR62

Time Table of Idling Current Rise

After Turning ON	Measurement Voltage (CN7X)
5 min	7.5 mV ± 0.5 mV
10 min	7.5 mV ± 0.5 mV
20 min	7.5 mV ± 0.5 mV
30 min	7.5 mV ± 0.5 mV
40 min	7.5 mV ± 0.5 mV
50 min	7.5 mV ± 0.5 mV
60 min	7.5 mV ± 0.5 mV

4. SERVICE MODE

MAIN CPU (IC105) Version, DSP (IC111) Version, HDMI CPU (IC61), USB CPU (IC35) Version and Segment CheckMode.

1. Connect the mains cord into the unit.
2. Press the POWER ON/OFF (STANDBY) button for turn on the unit.
3. Press the AUTO, EXIT and CLEAR buttons simultaneously more then 3 seconds.
4. The FL display shows “SERVICE MODE” for 2 seconds then shows the model name and the software version of the MAIN CPU (IC105) is displayed the format below.

MAIN CPU (IC105) Version, DSP (IC111) Version, HDMI CPU (IC61), USB CPU (IC35) Version and Segment Check Mode.

1. 本機に電源コードを接続します。
2. POWER ON/OFF (STANDBY) ボタンを押し、本機の電源を入れます。
3. AUTO, EXIT, CLEAR の 3 つのボタンを同時に 3 秒以上押します。
4. FL に "SERVICE MODE" と 2 秒表示し、次にモデル名と MAIN マイコン (IC105) を表示します。

△2

B	L	U	-	R	A	Y				:	A	H	1
S	E	R	V	I	C	E		M	O	D	E		

△2

				S	R	6	0	0	4	:	A	H	1
		V	0	7	0	9	2	7		0			

Year / Month / Date / Destination

△2

				S	R	6	0	0	4	:	A	H	1
		V	0	7	0	9	2	7		0			

年 / 月 / 日 / 仕向け

5. Press the ENTER button again, the software serial Number of the unit is displayed.

5. 更に ENTER ボタンを押すと、ソフトウエアシリアルナンバーが表示されます。

				S	R	6	0	0	4				
	M	Z		X	X	X	X	X	X	X	X	X	X

6. Press the ENTER button again, the TI DSP (IC111) B1 code is displayed.

6. 更に ENTER ボタンを押すと、TI DSP(IC111) B1 Code が表示されます。

				S	R	6	0	0	4				
		B	1		2	9	7	0	5	1	7	1	

7. Press the ENTER button again, the TI DSP (IC111) B2 code is displayed.

7. 更に ENTER ボタンを押すと、TI DSP(IC111) B2 Code が表示されます。

				S	R	6	0	0	4				
		B	2		2	9	7	0	4	0	2	1	

8. Press the ENTER button again, the software version of the HDMI CPU (IC61) is displayed.

8. 更に ENTER ボタンを押すと、HDMI CPU(IC61) のバージョンが表示されます。

				S	R	6	0	0	4				
	H	D	M	I		V	e	r	.	h	X	X	

9. Press the ENTER button again, the software version of the USB CPU (IC35) is displayed.

9. 更に ENTER ボタンを押すと、USB CPU(IC35) のバージョンが表示されます。

				S	R	6	0	0	4				
	U	S	B	:	0	8	0	5	0	7		1	

10. Press the ENTER button again, the left half, right half and center of the label area in the FLD light on and off each other.

11. Press the ENTER button again, the segments of the character area in the FLD flick in checker pattern.

12. Press the ENTER button again, all the FL segments turn off.

13. Press the ENTER button again to quit this mode.

10.更に ENTER ボタンを押すと、FL のラベル部分の左半分と右半分および中心部が交互に点灯と消灯を繰り返します。

11.更に ENTER ボタンを押すと、FL のキャラクタセグメント部がチェッカーフラグのように点灯と消灯を繰り返します。

12.更に ENTER ボタンを押すと、FL は全消灯します。

13.更に ENTER ボタンを押すと、サービスモードを終了します。

HOW TO RESET THE UNIT

Should the operation or display seem to be abnormal, reset the unit with the following procedure.
The unit is turned on, press and hold the SURROUND MODE and CLEAR buttons simultaneously for 3 seconds or more. Remember that the procedure will reset the settings of the function selector, Surround mode, delay time, TUNER PRESET etc., to their initial settings.

初期状態に戻すには（リセット）

但しリセット行うと、プリセットメモリ等の設定した内容が消去されます。

1. 電源が入っていることを確認します。
2. 本体の SURROUND MODE ボタンを押しながら、CLEAR

ボタンを 3 秒以上押します。

本機は一度スタンバイ状態になった後、再度 POWER − ON 状態となり、各種設定された内容が初期化され、工場出荷時の状態に戻ります。

5. SYSTEM ERROR

Check 1

- **Indication of abnormalities with the EEP-ROM (HDMI PWB / IC89) Interface**

  This indicates a communication error wherein the ACK will not return for 2 seconds or more while the system is in communication with the EEP-ROM (INPUT PWB / IC89).

  - Message on FL displayw.

C	H	E	C	K		E	2	P		I	F		

Points to be checked

1. The IIC Clock Line (IC105/116 pin . IC89/6 pin) is normal when the power is ON.
2. The IIC Data Line (IC105/117 pin . IC89 / 5 pin) is normal when the power is ON
3. The IC89/8 pin is supplied with VCC +3.3V.
4. If none of the above is negative, the IC89 may be having a defect.

Check 1

・EEP-ROM (INPUT PWB / IC89) Interface 異常検出

EEP-ROM (INPUT PWB / IC89) との通信で ACK が帰ってこない状態（通信エラー）が約２秒以上生じた場合 FL Display に下記の様な表示がされます。

- FL Display への Error 表示

回路上の確認箇所

1. Power ON 時に IIC Clock Line (IC105/116pin - IC89 /6pin) が正常なのを確認する。
2. Power ON 時に IIC Data Line (IC105/117pin - IC89 /5pin) が正常なのを確認する。
3. IC89 / 8pin に VCC (+3.3V) が供給されていることを確認する。
4. 上記の１－３に不具合が生じていない場合は IC89 の不良が考えられます。

Check 2

- **+5V supply Error Detection (_5V DOWN)**

  When the power is turned on or while the unit is in normal operation, an abnormality occurs with the +5V power supply, and the +5V power into the CPU 137 pin cannot be detected.

- **Detection of DC on Power Amp Output (_P AMP FAIL)**

  When the power is turned on or while the unit is in normal operation, an abnormality occurs with the Power Amp, and DC is detected on the CPU 121 pin.

- **Detection of abnormal heat of Power Amp (_P AMP FAIL)**

  The Power Amp is overheated while in normal operation,with an abnormality detected on the CPU 121 pin.

- **Detection of Overcurrent below 200msec on Power Amp (_P CUR FAIL)**

  When the product is in normal operation, an abnormality occurs with the POWER AMP, and an overcurrent of less than 200msec is detected on the CPU 120 pin.

When errors like the above abnormalities are detected, the software automatically puts the product into STANDBY mode, with the STANDBY LED flickering approximately every 500msec.

NOTE : The product can recover from the SYSTEM ERROR when the user turns on and then off the STANDBY. However, once any of the above errors is redetected, the product goes into STANDBY again.

Points to be checked

1. The CN81 (HDMI PWB) 7 & 8 pins are supplied with +5V when the power is ON
2. The CN85 10pin (Power Amp Fail) is outputting the "H" signal; (If the 10 pin continues to be in the "L" state for 2 seconds or more after the power is turned ON, the Power Amp circuit is having a problem.)

Check 2

・+5V Supply 異常検出 (_5V DOWN)

電源 ON 時又は通常動作時に +5V 電源に異常が発生し、CPU の 137pin に入力される +5V の検出が出来なかった（出来なくなった）場合。

・Power Amp 出力の DC 検出 (_P AMP FAIL)

電源 ON 時又は通常動作時に Power Amp に異常が発生し、CPU の 121pin で Power Amp 出力の DC 検出がされた場合。

・Power Amp の異常温度検出 (_P AMP FAIL)

通常動作時に Power Amp の異常な温度上昇が発生し、CPU の 121pin で異常が検出がされた場合。

・Power Amp の 200msec 未満の過電流検出 (_P CUR FAIL)

通常動作時に Power Amp に異常が発生し、CPU の 120pin で Power Amp の過電流が 200msec 未満で検出された場合。

上記の様な異常検出がされた場合は、Software は自動的に製品を STANDBY 状態にして、STANDBY LED を約 500msec 間隔で点滅させます。

復帰操作：

この System Error は User が STANDBY ON/OFF 操作を行うことで通常動作に復帰しますが、上記の異常を再検出することで製品は再び System Error となります。

回路上の確認箇所

1. 電源 ON 時に CN81 (HDMI PWB) 7, 8pin に +5V が供給されていることを確認する。
2. 電源 ON 時に CN85 の 10pin (Power Amp Fail) が "H" になっていることを確認する。
   (10pin が電源 ON してから２秒以上 "L" 状態が継続している場合は POWER AMP 回路に異常が発生している)

3. Check that the speaker cable connected to the product is not in contact and shorting out.
4. The Microprocessor 25 pin (Power Down) is outputting the "H" signal when the power is turned ON. (If the 25pin continues to be in the "L" state after the power is turned on, the MAIN PWB circuit , the IC60 and its adjacent circuits are developing an abnormality.)

NOTE : HOW TO RECOVER FROM SYSTEM ERROR (STANDBY LED flickering) The product can recover by turning on STANDBY on the remote controller after the above errors are rectified.

Check 3

- **Detection of Overcurrent over 200 msec on POWER AMP (_P CUR FAIL)**

  When the power is turned on or while the product is in normal operation, an abnormality occurs with the POWER AMP, and an overcurrent of 200msec or more (500msec or more when the power is on) is detected on the CPU 120 pin.

- **Detection of an abnormality on +/-12V Supply or Power Amp power supply (_P LINE FAIL)**

  When the power is turned on or while the product is in normal operation, an abnormality occurs with the +/-12V supply or POWER AMP power supply with an abnormality detected on CPU 122 pin.

When errors like the above abnormalities are detected, the software automatically puts the product into STANDBY mode, with the STANDBY LED flickering approximately every 125msec.

NOTE : This SYSTEM ERROR cannot be rectified by users. In order to power on the product, please do the following.

: Hold down "SURROUND MODE", "EXIT" & "CLEAR" at the same time for 3 seconds or more. However, if any problem remains with the product, the SYSTEM ERROR will occur again.

Points to be checked on the circuit

1. Check that the 120 pin (_P CUR FAIL) of the microprocessor is outputting "H". (If the 120pin is in the L-state for 500msec or more after the power is turned on, the POWER AMP circuit is developing an abnormality.)
2. Make sure that the 122pin of the microprocessor (POWER LINE FAIL) is "H". (If the 122 pin is in the L-state for 2 seconds or more after the power is turned on, the +/-12V power supply or the POWER AMP power supply is developing an abnormality.)

3. 製品に接続されている Speaker Cable が +/- 又は RearPanel 等に Short していないか確認する。
4. 電源 ON 時にマイコンの 25pin (Power Down) が "H" になっていることを確認する。
(電源 ON しても、25pin が "L" 状態で継続している場合は MAIN PWB 上の IC60 及び周辺回路に異常が発生している)

復帰操作 :
System Error (STANDBY LED の点滅) からの復帰は上記の不具合を改善後リモコンの STANDBY ON 操作で復帰できます。

Check 3

・Power Amp の 200msec 以上の過電流検出 (_P CUR FAIL)

電源 ON 時又は通常動作時に Power Amp に異常が発生し、CPU の 120pin で Power Amp の過電流が 200msec 以上 (Power ON 時は 500msec 以上) 検出された場合。

・+/- 12V Supply 又は、Power Amp 用電源の異常検出 (_P LINE FAIL)

電源 ON 時又は通常動作時に +/-12V 電源又は、Power Amp 用の電源に異常が発生し、CPU の 122pin で異常検出がされた場合。

上記の様な異常検出がされた場合は、製品を STANDBY 状態にして、STANDBY LED を約 125 msec 間隔で点滅させます。

ご注意 : この System Error は User が通常動作に復帰させることは出来ません。製品の電源を ON させる場合は次の操作を行います。

復帰操作 :
"SURROUND MODE" + "EXIT" + "CLEAR" ボタンを同時に押して 3 秒以上保持する。
但し、製品に不具合が残っている場合は再び SYSTEM ERROR が働きます。

回路上の確認箇所

1. 電源 ON 時にマイコンの 120pin (_P CUR Fail) が "H" になっていることを確認する。
(120pin が電源 ON してから 500 msec 以上 "L" 状態が継続している場合は POWER AMP 回路に異常が発生している)
2. 電源 ON 時にマイコンの 122pin (Power Line Fail) が "H" になっていることを確認する。
(122pin が電源 ON してから 2 秒以上 "L" 状態が継続している場合は +/-12V 電源又は、Power Amp 用の電源に異常が発生している)

Check 4

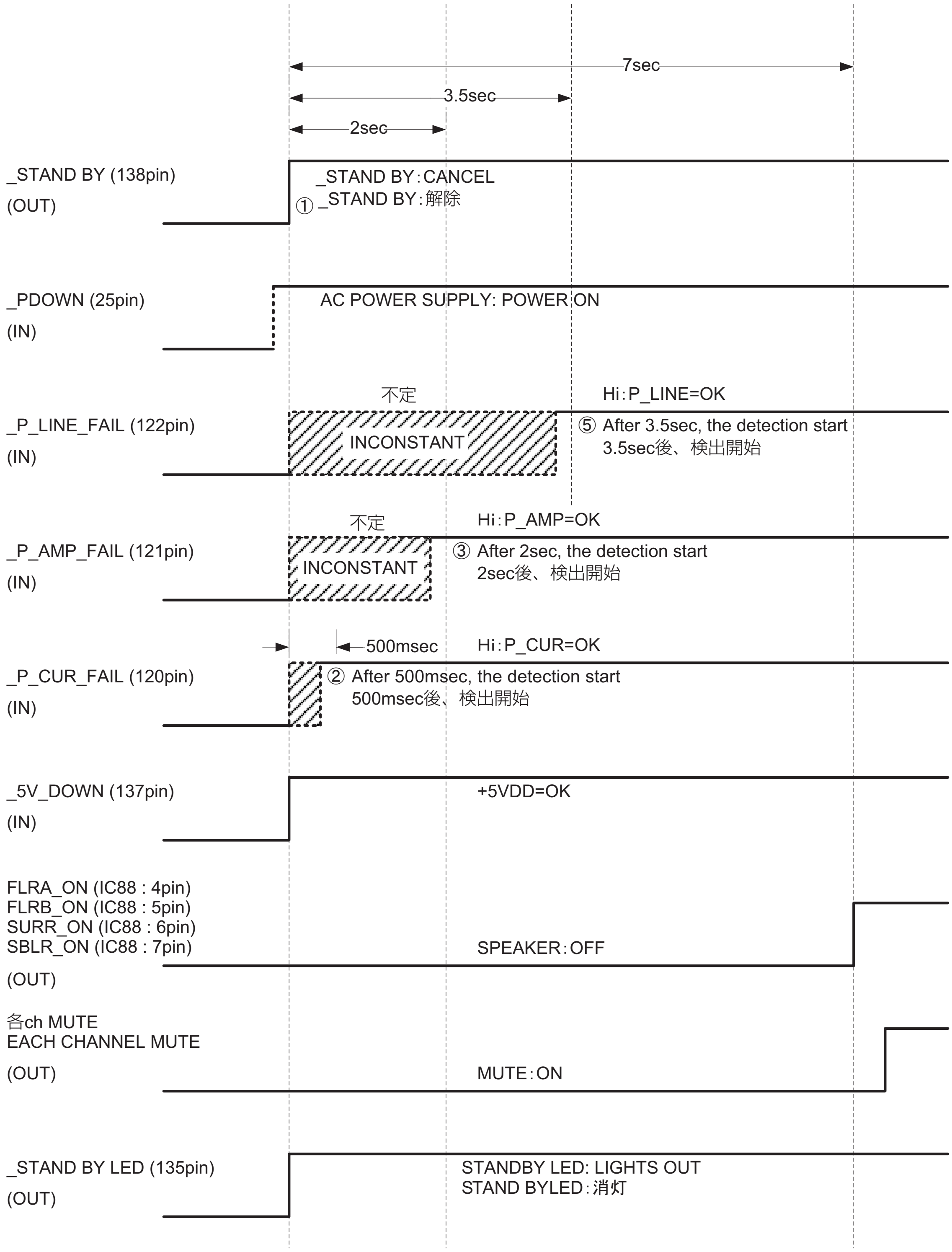
• TIMING CHART

Normal operation when the power is turned on

Check 4

・TIMING CHART

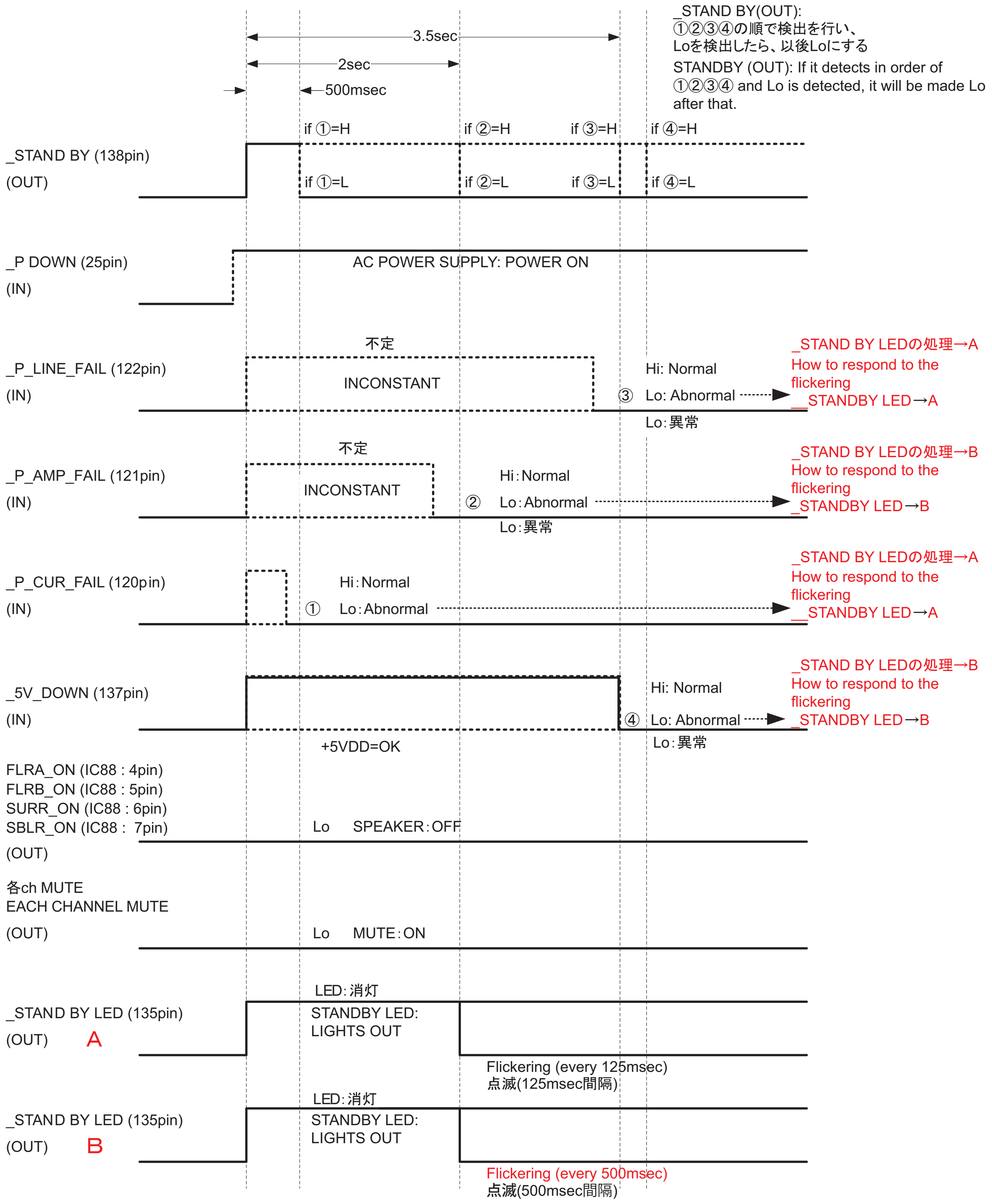
電源 ON 時の正常動作



For the product to start operating normally when the power is turned on, the circuit connected to each input port of _P DOWN, _5V DOWN, _P CUR FAIL, _P AMP FAIL and _P LINE FAIL needs to be operating normally.

電源 ON 時に製品が通常動作を開始するためには、上図の様な Timing で _P DOWN, _5V DOWN_P CUR FAIL, _P AMPFAIL, _P LINE FAIL の各入力 Port で接続されている回路が正常動作している必要があります。

Normal detection operation when the power is turned on　　電源 ON 時の異常検出動作



6. TROUBLE SHOOTING

Symptom	Reason	Check Points
The power cannot be turned on.	・+5VL is not outputted. ・The voltage between CN85-20pin and GND is not 5V.	・T600,IC51,D606~D609 (MAIN)
	・Main CPU is not work. ・Front panel is not correctly connected with Main CPU.	・IC105,IC90(HDMI) ・CN82(HDMI) ・BN82(FRONT)
Standby LED blinks slowly.	・F602 has been disconnected. (When F602 has been disconnected, the serious stumbling block might be generated.)	・Main Transformer ・D201,C636,C637(MAIN)
	・F603 has been disconnected. (F603 cuts when the protection of Main CPU doesn't work.)	・F603,Q610,CN66(MAIN) ・CN31,BN85(USB/CNT) ・Each Transistor of Power amplifier.(MAIN)
Turns on and then off the STANDBY. Standby LED flickering slowly.	・The temperature of the heat sink is abnormally high. ・The voltage-controlled circuit is defective. ・The temperature detection circuit is defective. ・P_AMP_FAIL(CN85-10pin) is 0V.	・RL20,Q200,Q201,CN23(REG) ・CN69,TH60,Q615(MAIN)
	・The DC voltage of several V or more has been generated in the output of the power amplifier. ・P_AMP_FAIL(CN85-10pin) is 0V.	・The voltage between each 1pin and GND of CN70~76(MAIN) is confirmed. ・Each Tr. Of Power amplifier (MAIN) ・ET60,CN68(MAIN) ・CN51(INPUT)
Turns on and then Standby LED flickering faster.	・The power supply circuit breaks down and a more abnormal voltage has been detected short. (+12V/-12V/+55V/-55V) ・P_LINE_FAIL(CN85-12pin) is 0V.	・IC24,IC25,D201~D205(REG) ・C636,C637(MAIN) ・Q513,Q514(INPUT)
	・An abnormal current flows to any power transistor due to the breakdown of the power amplifier. ・P_CURR_FAIL(CN85-16pin) is 0V.	・The voltage between each 1pin and 2pin of CN70~76(MAIN) is confirmed. ・Q706,708,713,715, 703,705,719,721, 709,710,716,718, 711,712(MAIN)
All segment of FL Display is turrn on.	・+5VD Supply is fail. ・+5V is not supplied to FL display.	・F201,D208,IC21,BN22(REG) ・CN81,CN82(HDMI PWB) ・BN82,FL10(FRONT)
"CHECK E2P IF"on the FL DISPLAY	・EEP-ROM cannot be normally rewritten.	・IC86,IC115(HDMI)

( ):PWB name

6. トラブルシューティング

症状	理由	チェックポイント
電源が入らない	・+5VL 電源が故障している ・CN85-20pinとGND間の電圧が5Vになっていない	・T600,IC51,D606 ～ D609(MAIN)
	・Main CPU が動作していない ・操作パネルが Main CPU と正しく接続されていない	・IC105,IC90(HDMI) ・CN82(HDMI) ・BN82(FRONT)
電源を入れると、Standby LED がゆっくりと点滅する	・F602 が断線している (F602 が断線している場合は、重大な障害が発生していることがあります。)	・Main Transformer ・D201,C636,C637(MAIN)
	・F603 が断線している (F603はMain CPUによる保護が万一機能しなかった場合に溶断します)	・F603,Q610,CN66(MAIN) ・CN31,BN85(USB/CNT) ・Power amplifier の各トランジスタ (MAIN)
電源を入れると直ぐに電源が落ちて、Standby LED がゆっくりと点滅する	・ヒートシンクの温度が異常に高い ・電圧制御回路が不良 ・温度検出回路が不良 ・P_AMP_FAIL(CN85-10pin) が 0V になっている	・RL20,Q200,Q201,CN23(REG) ・CN69,TH60,Q615(MAIN)
	・パワーアンプから DC 電圧が出力されている ⚠2 ・P_AMP_FAIL(CN85-10pin) が 0V になっている ⚠2	・The voltage between each 1pin and GND of CN70~76(MAIN) is confirmed. ・Each Tr. Of Power amplifier (MAIN) ・ET60,CN68(MAIN) ・CN51(INPUT)
電源を入れるとStandby LEDが速く点滅する	・電源回路の故障やショートにより異常電圧が検出されている (＋12V/-12V/+55V/-55V) ・P_LINE_FAIL(CN85-12pin) が 0V になっている ⚠2	・IC24,IC25,D201~D205(REG) ・C636,C637(MAIN) ・Q513,Q514(INPUT)
	・パワーアンプの故障によりどれかの Power Transistor に異常な電流が流れている ・P_CURR_FAIL(CN85-16pin)が0Vになっている	・CN70 ～ 76(MAIN) の各 1pin と 2pin 間の電圧を確認 ・Q706,708,713,715, 703,705,719,721, 709,710,716,718, 711,712(MAIN)
FL Display のセグメントが全て点灯する	・+5VD 電源が故障している ・FL display に +5V が供給されていない	・F201,D208,IC21,BN22(REG) ・CN81,CN82(HDMI PWB) ・BN82,FL10(FRONT)
FL Display に、"CHECK E2P IF" と表示される	・EEP-ROM とのリード / ライトが正常に行えない	・IC86,IC115(HDMI)

（　）内は基板名称

7. JIG FOR SERVICING ⚠2

When you repair the printing board, you can use the following JIG (Extension cable kit). Please order to Marantz Official Service. Distributor in your region if necessary.

Note:

When the connection which is wrong in the JIG (Extension cable kit) is done it becomes cause of damage.

998619000470S :
extension wire for SR6004/5004 HDMI PWB : 2 Set

998619000480S :
extension wire for SR6004/5004 INPUT PWB : 1 Set

HDMI PWB (CUP12207)、INPUT PWB (CUP12208)、MAIN PWB (CUP12206) を修理する場合、必要に応じて以下のサービス用延長治具をご使用下さい。発注は SPC にご連絡ください。

注意）

サービス用延長治具を間違った接続をすると故障する場合があります。

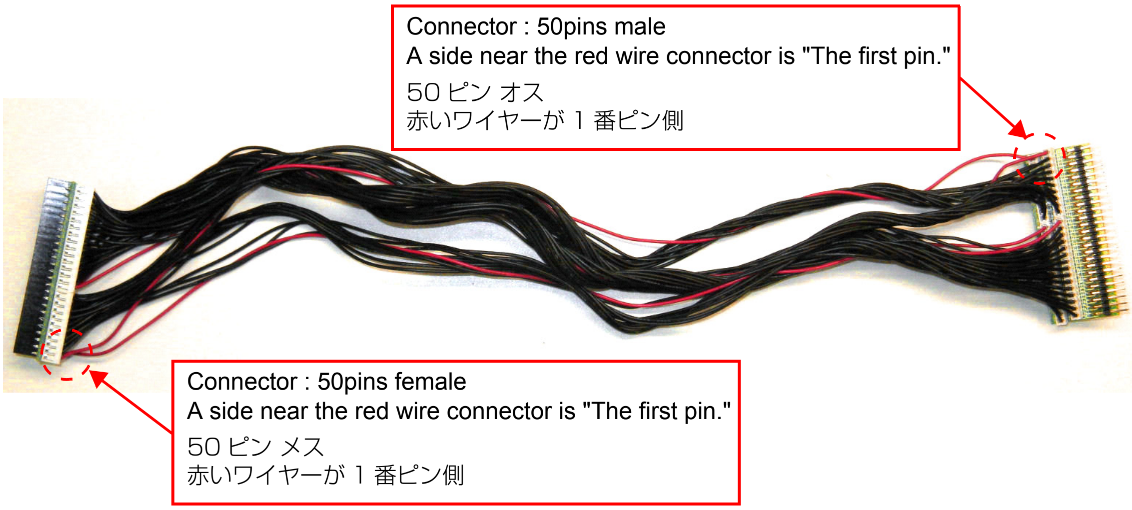
998619000470S :
extension wire for SR6004/5004 HDMI PWB : 2 本

998619000480S :
extension wire for SR6004/5004 HDMI PWB : 1 本

998619000470S : extension wire for SR6004/5004 HDMI PWB : 2 Set



998619000480S : extension wire for SR6004/5004 INPUT PWB : 1 Set



7-1 Connection of HDMI PWB JIG

-Preparation-

998619000470S :

extension wire for SR6004/5004 HDMI PWB : 2 Set

Insulation sheet 1(Do not supply it)

1. HDMI PWB (CUP12207) is detached from the chassis, and it puts it into the state turned inside out.
   Please pave an insulation sheet that is larger than HDMI PWB under PWB.

7-1 HDMI PWB 用延長治具の接続

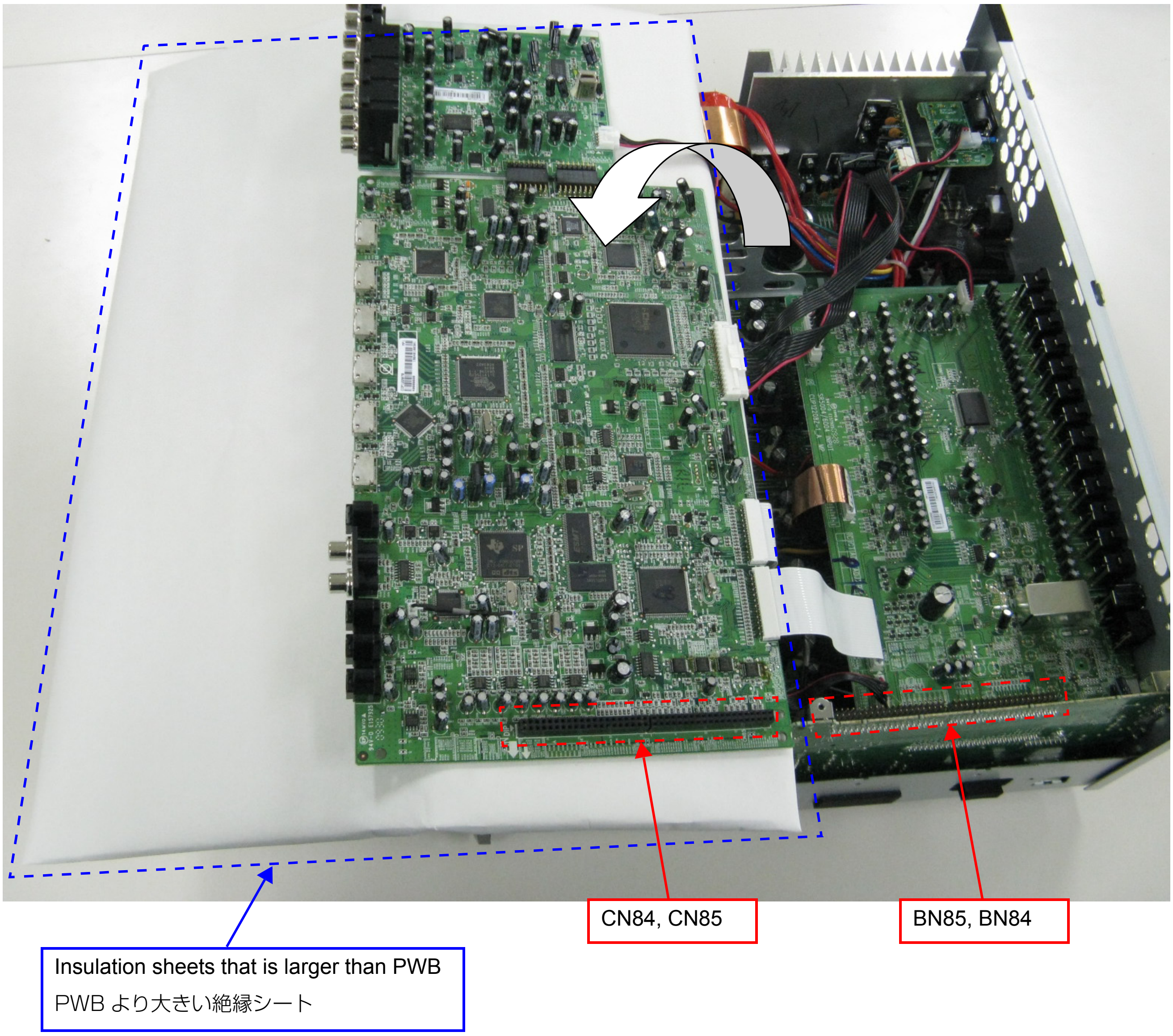
- 準備する物 -

998619000470S :

extension wire for SR6004/5004 HDMI PWB : 2 本

絶縁シート -- 1 枚 (D&M では供給しません)

1. HDMI PWB（CUP12207）をシャーシから取り外し、裏返した状態にします。
   HDMI PWB の下に PWB より大きい絶縁シートを敷いて下さい。



2. Two extension wires for SR6004/5004 HDMI PWB are connected.
   Refer to the close-up also.

Note:
When the connection which is wrong in the JIG (Extension cable kit) is done it becomes cause of damage.

2. extension wire for SR6004/5004 HDMI PWB を接続します。
   拡大図も併せて参照して下さい。

注意）
サービス用延長治具を間違った接続をすると故障する場合があります。

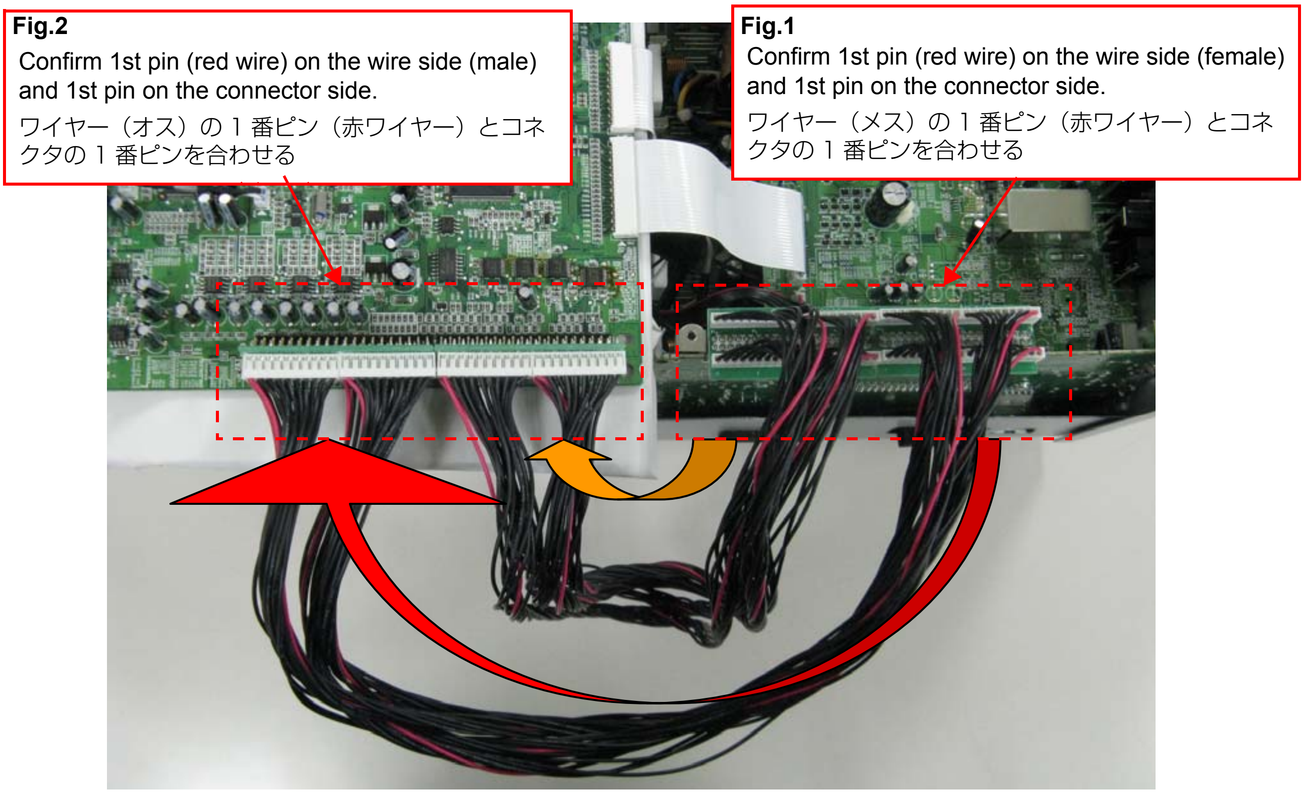


Fig.1 USB/CNT PWB Side

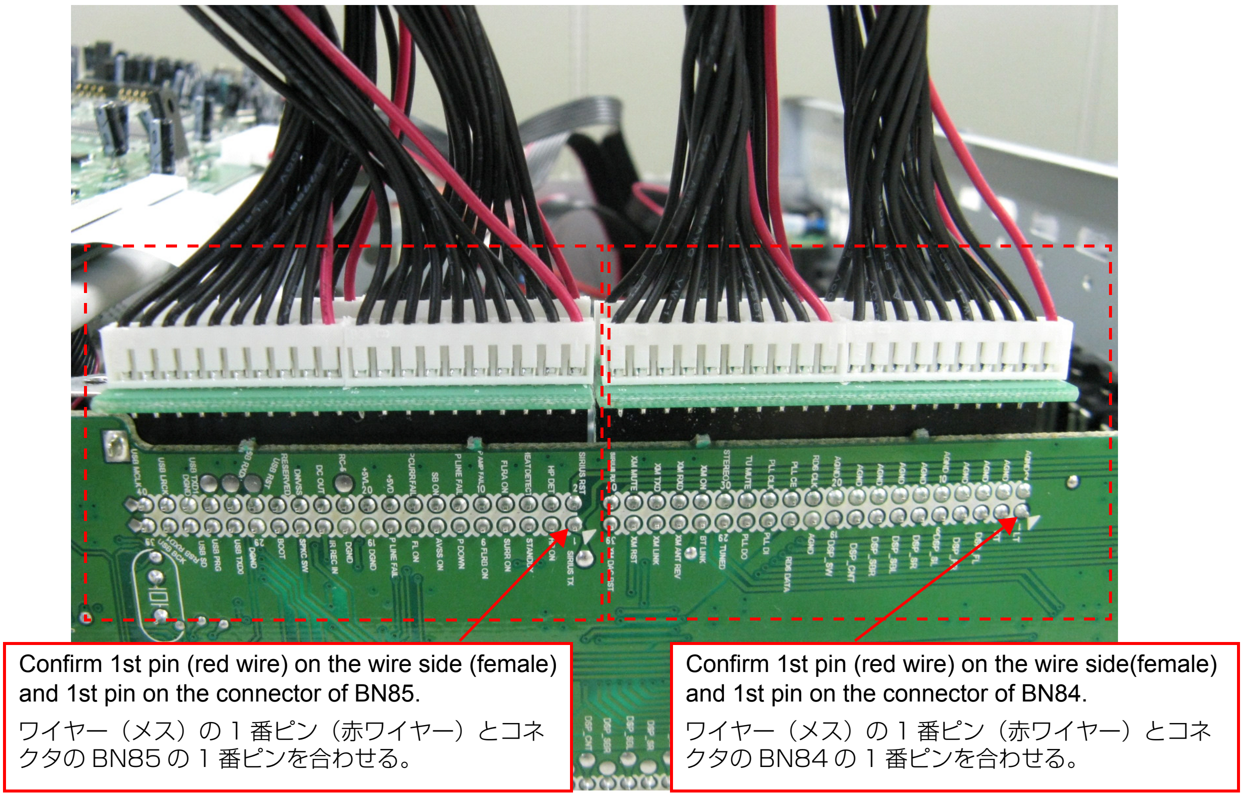
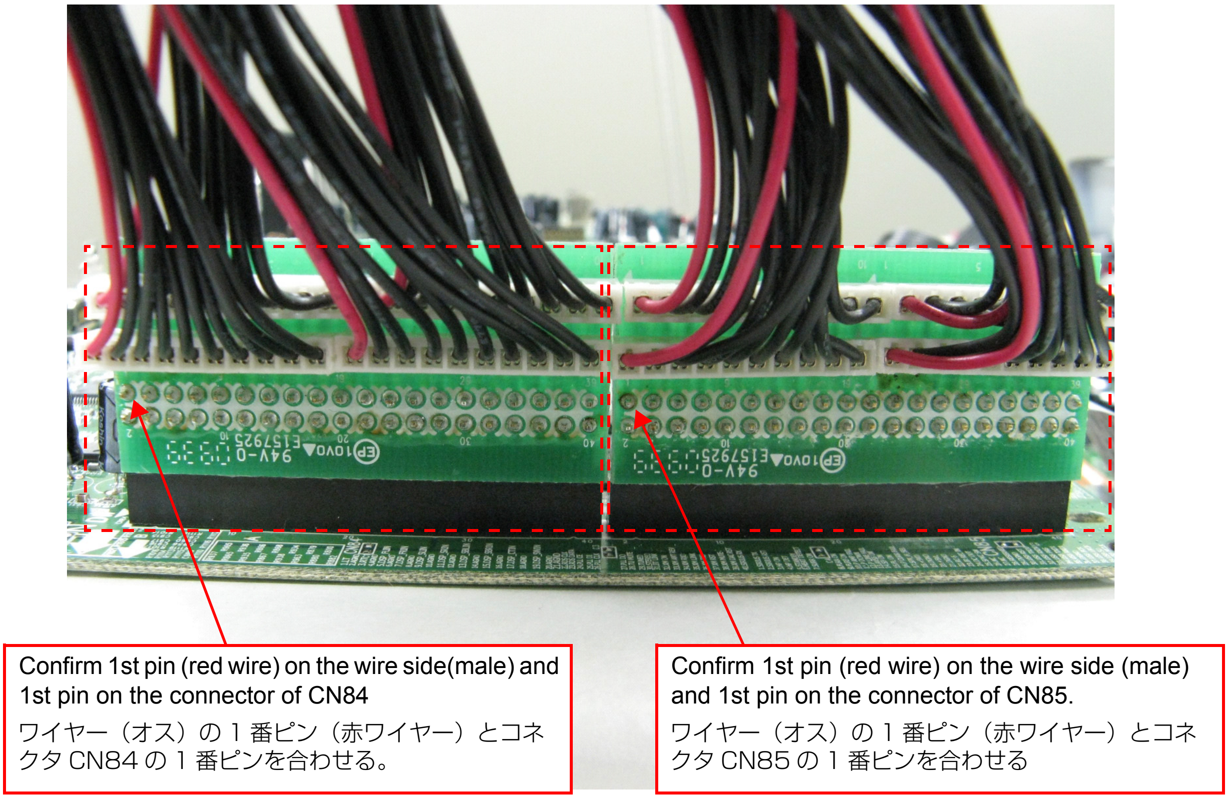
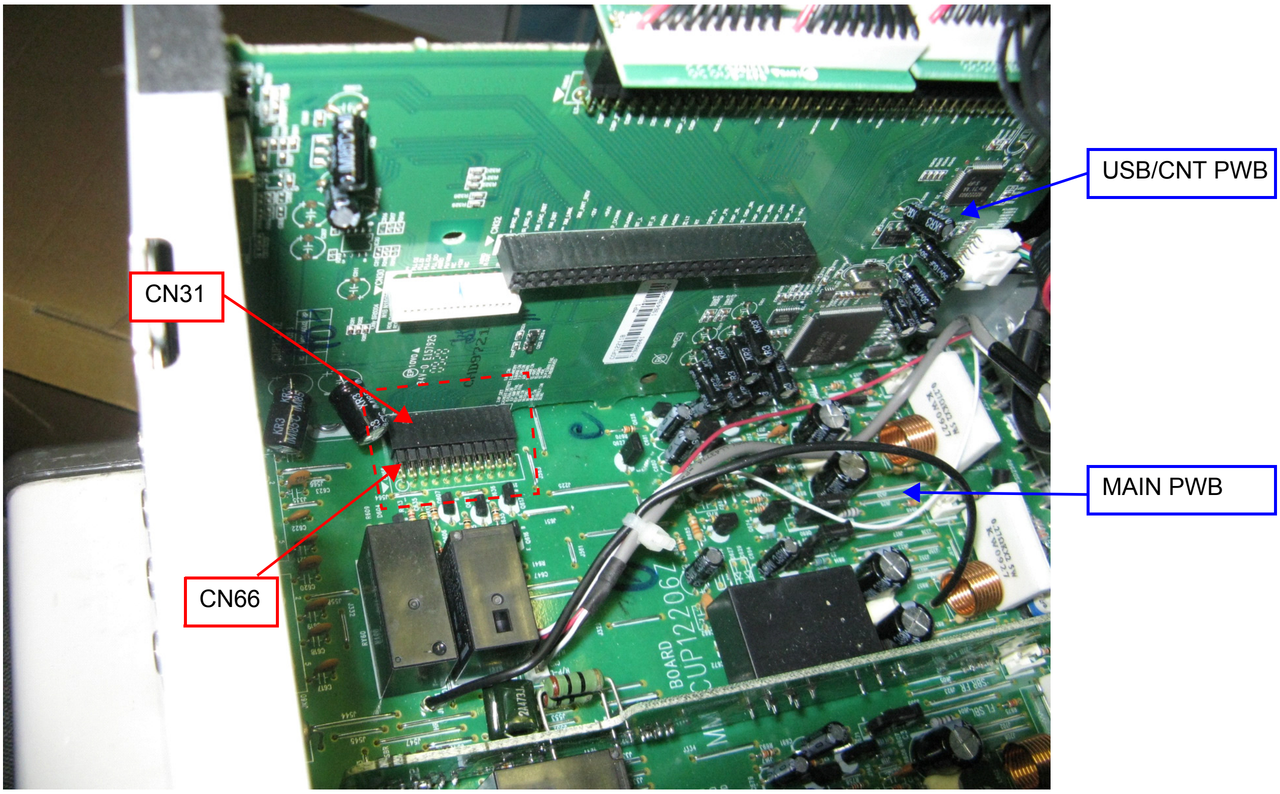


Fig.2 HDMI PWB Side



Note:
As for CN66 of CN31 of USB/CNT PWB, and MAIN PWB, the connection becomes loose upon service. Please confirm the firm connection.

注意）
サービスに際し、USB/CNT PWB の CN31 と MAIN PWB の CN66 は接続が緩くなります。しっかり接続されていることを必ず確認して下さい。



7-2 Connection of INPUT PWB JIG

-Preparation-

998619000480S :
extension wire for SR6004/5004 INPUT PWB : 1 Set
Insulation sheet 1(Do not supply it)

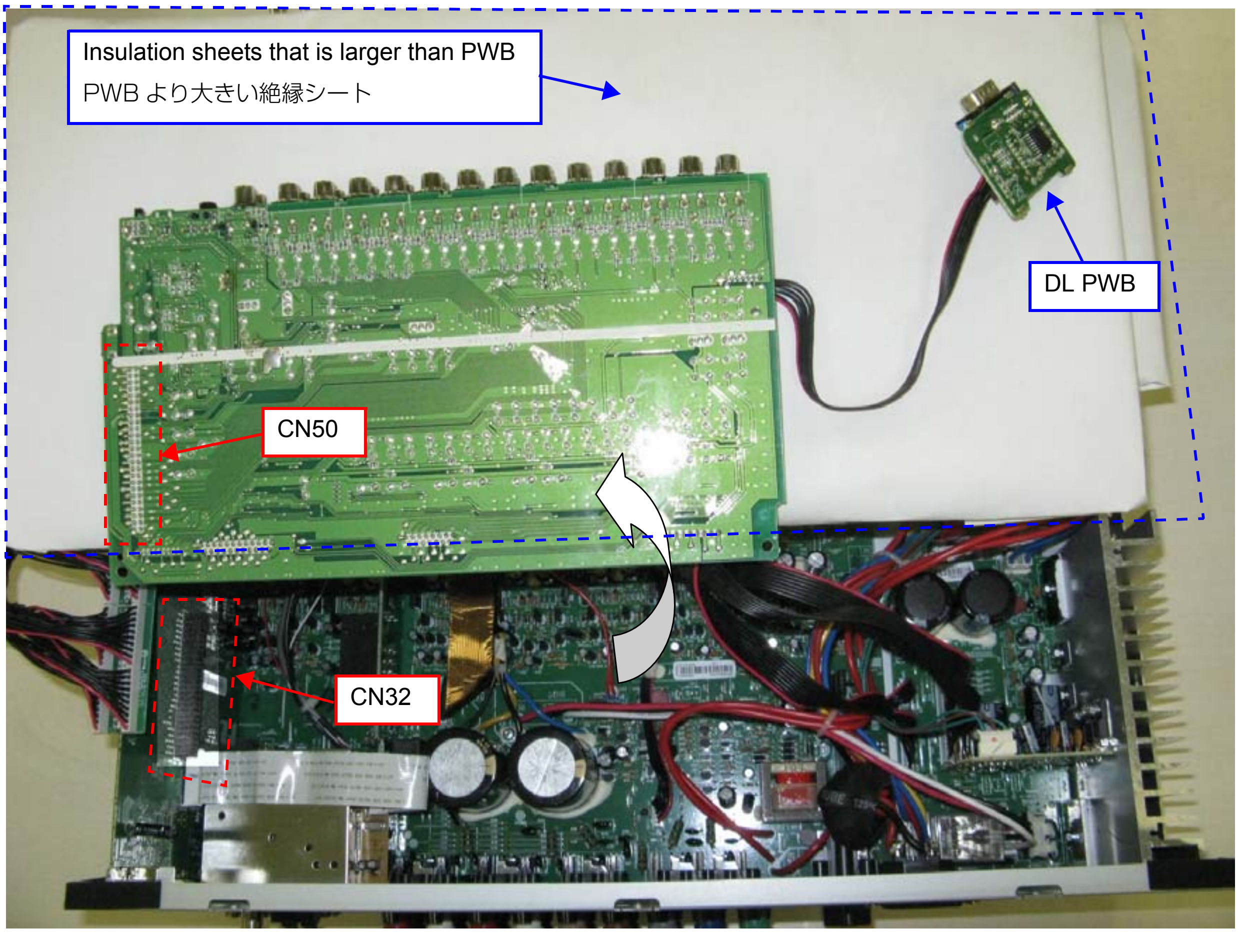
1. First of all, please connect the extension treatment device for HDMI PWB in the foregoing paragraph (7-1 Connection of HDMI PWB JIG).
   INPUT PWB(CUP12208) is detached from the chassis, and turned inside out. Please pave an insulation sheet that is larger than INPUT PWB.

7-2 INPUT PWB 用延長治具の接続方法

- 準備する物 -

998619000480S :
extension wire for SR6004/5004 INPUT PWB : 1 本
絶縁シート -- 1 枚 (D&M では供給しません)

1. 事前に、前節 (7-1 HDMI PWB 用延長治具の接続) の HDMI PWB 用延長治具の接続を行って下さい。
   INPUT PWB（CUP12208）をシャーシから取り外し、裏返します。INPUT PWB より大きい絶縁シートを敷いて下さい。



2. Two extension wire for SR6004/5004 INPUT PWB are connected.
   Refer to the close-up also.

Note:
When the connection which is wrong in the JIG (Extension cable kit) is done it becomes cause of damage.

2. extension wire for SR6004/5004 INPUT PWB を接続します。
   拡大図も併せて参照して下さい。

注意）
サービス用延長治具を間違った接続をすると故障する場合があります。

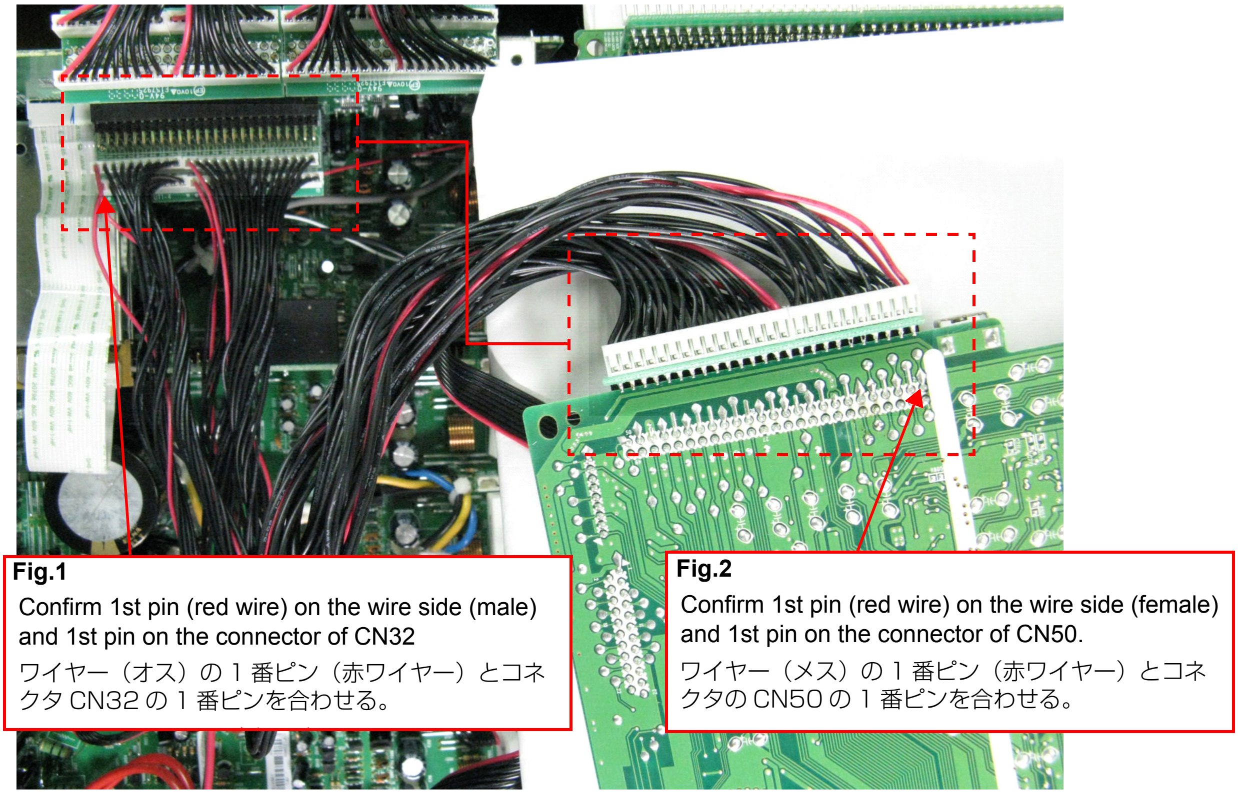


Fig.1 USB/CNT PWB Side

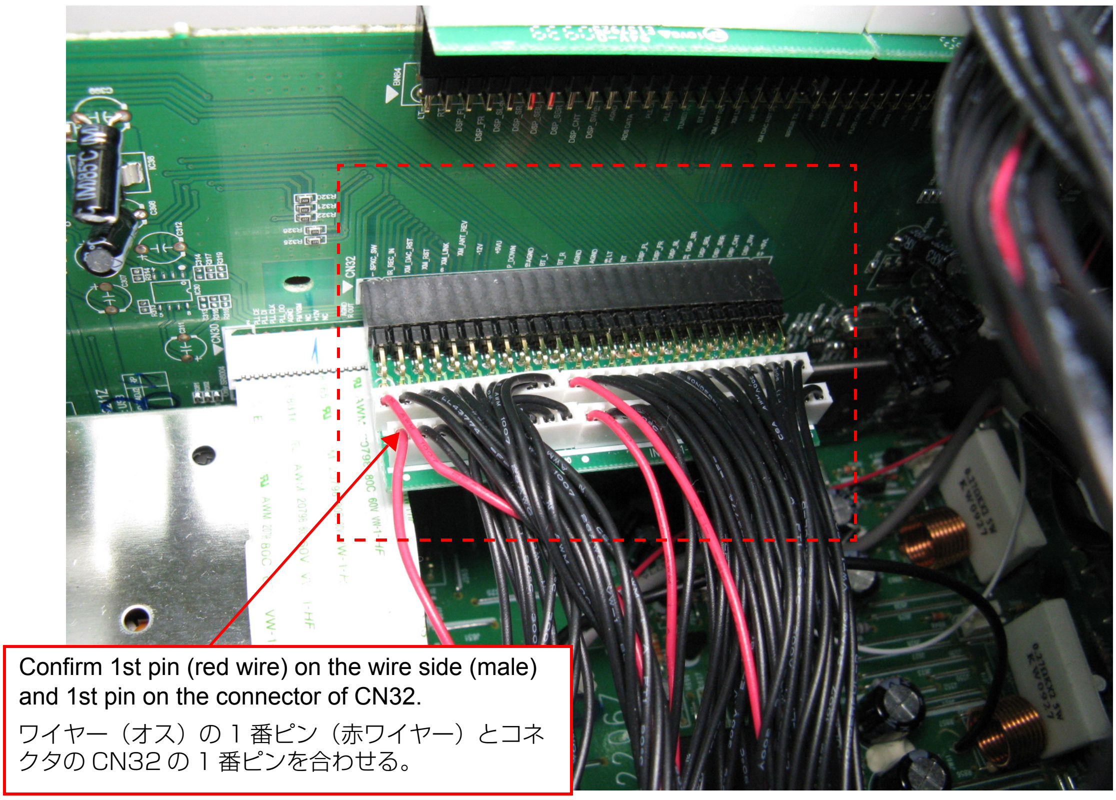
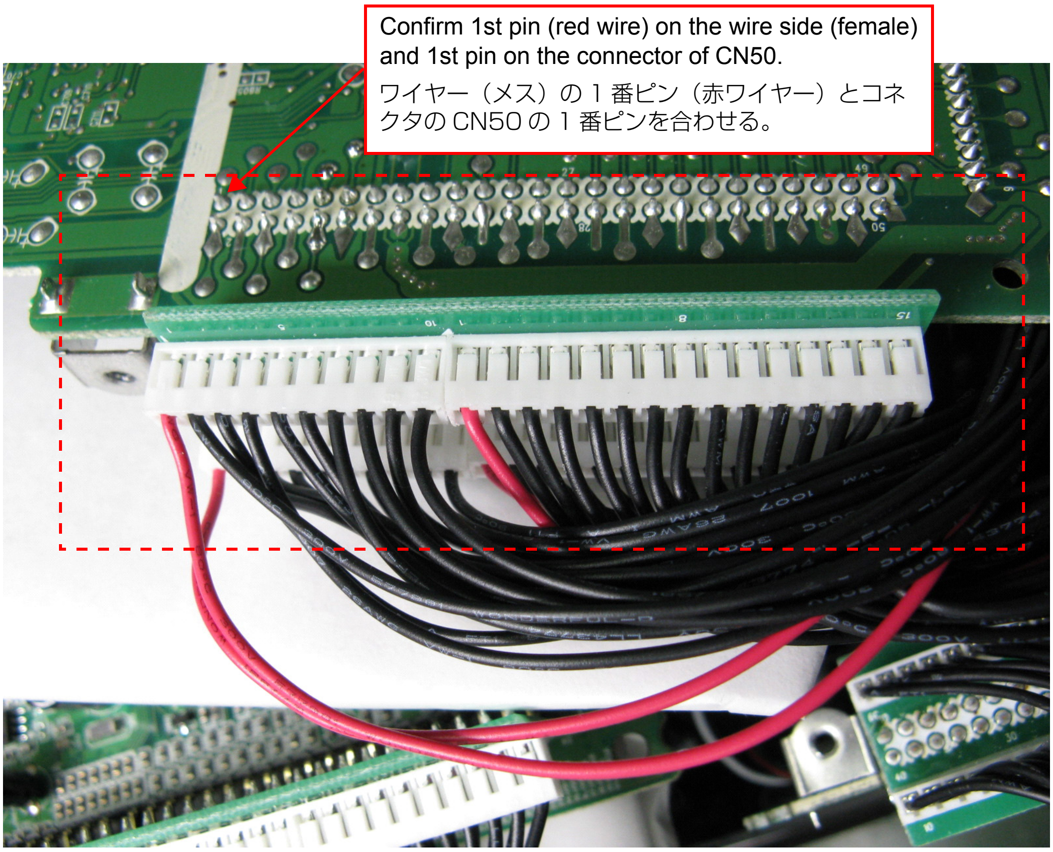
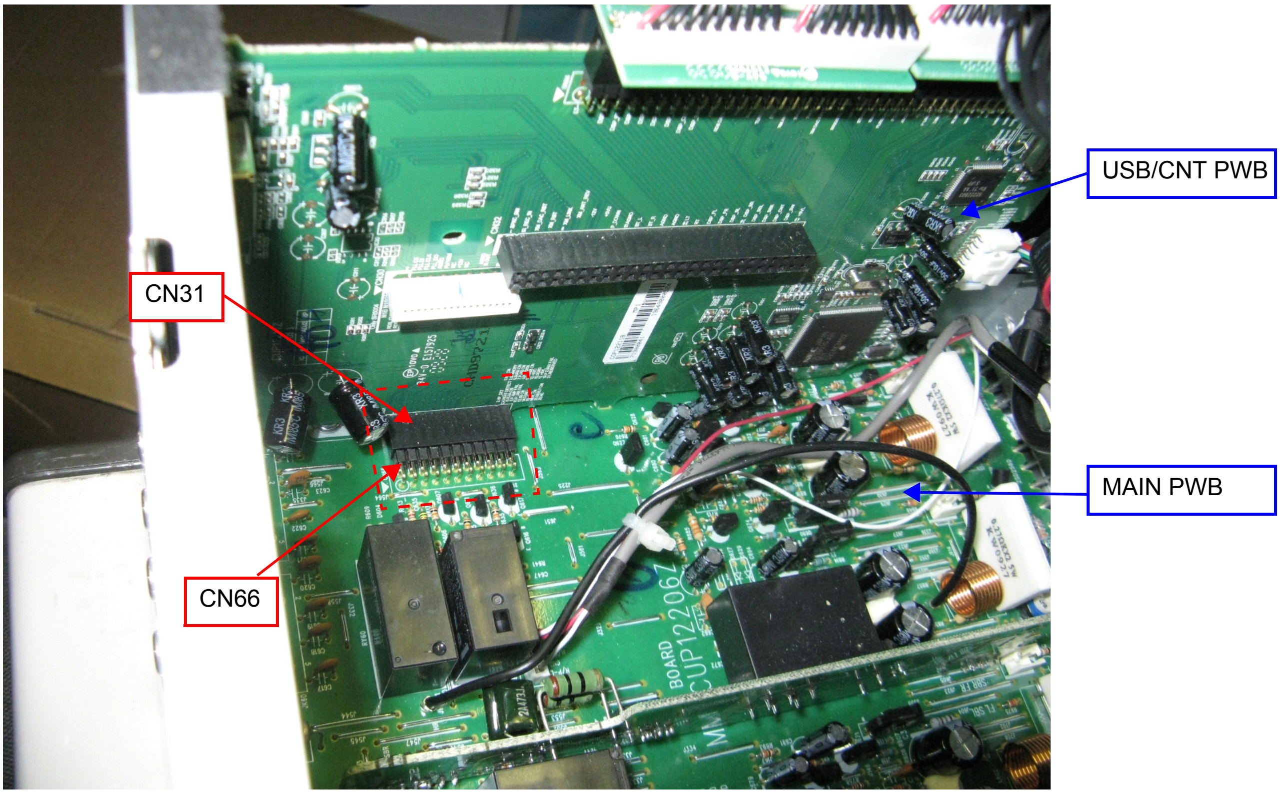


Fig.2 INPUT PWB Side



Note:
As for CN66 of CN31 of USB/CNT PWB, and MAIN PWB, the connection becomes loose upon service. Please confirm the firm connection.

注意）
サービスに際し、USB/CNT PWB の CN31 と MAIN PWB の CN66 は接続が緩くなります。しっかり接続されていることを必ず確認して下さい。



8. DUAL BACKUP MEMORY

This product has a Dual Backup Memory function. The conventional Backup functions to memorize, in the EEP-ROM (IC89) in the circuit, a current setting of the moment the main power is turned off so that it can be restored when it is turned ON again. Meanwhile, the DUAL BACKUP MEMORY is capable of memorizing any arbitrary setting that is configured while the product is in operation so as to restore it at any time.
When servicing units returned from end-users for repairs, use this function to back up the current setting (e.g. Tuner Preset). This will enable the units to be returned to the users after repairs, with the setting unchanged.

NOTE : If end-users use this function, the data will be overwritten.

• HOW TO OPERATE

-Backup-

1. Configure a setting you would like to save in the MEMORY and hold down the [MEMORY] and [ENTER] buttons on the Front Panel at the same time for 3 seconds or more.
2. The FL Display indicates "MEMORY SAVING" while the Backup is being performed.
3. The FL Display indicates "COMPLETE" when the Backup is completed.

-Recovery-

1. Hold down the [MEMORY] and [MENU] buttons on the Front Panel at the same time for 3 seconds or more. △2
2. The FL Display indicates "MEMORY LOAD" while the Recovery is being performed.
3. After the FL Display indicates "COMPLETE", the product goes into Standby mode. When the power is restored, the Recovery is completed. The FL Display indicates "NO BACKUP" if the DUAL BACKUP MEMORY has not been activated with no data to be recovered saved in the Memory. This function does not back up the levels of Main ZONE Volume, ZONE A Volume and ZONE A Speaker Volume. When the Recovery is done, - ∞ is indicated.

• SERVICE PRECAUTIONS

When the Flash Rom (IC89) on the INPUT PWB is replaced or when the DSP CODE is rewritten for a version upgrade, make sure, in order to maintain consistency with the Backup Memory, to clear the DUAL BACKUP MEMORY in thefollowing way :

-How to clear the Backup Memory--

1. Hold down the [MEMORY] and [CLEAR] buttons on the-Front Panel at the same time for 3 seconds or more. △2
2. The FL Display indicates "BACKUP CLEAR" while the memory is being cleared.
3. After the FL Display indicates "COMPLETE", the operation is completed.

本機は Dual Backup Memory 機能を持っています。

通常の Backup は製品の主電源が切られた時に、その時の状態を回路上の EEP-Rom (IC89) に Memory して、電源が ON された時にその状態を復帰させますが、DUAL BACKUP MEMORY 機能は、動作状態にある任意の状態を Memory して、いつでもその状態を復帰させることが出来る機能です。

この機能を使って End User から修理依頼を受けた時の状態を Back Up させておけば、修理後に確認の操作をしても、User が使用していたときの状態 (Tuner の Preset 等) を復帰させて返却することもできます。

ご注意： End User がこの機能を使用していた場合はその Data は上書きされてしまうので注意が必要です。

・操作方法

-Backup 操作 -

1. 製品を Memory したい状態にして、Front Panel 上の [MEMORY] と [ENTER] ボタンを同時に 3 秒以上押し続けます。
2. FL Display に "MEMORY SAVING" と表示され Backup 処理が行われます。
3. FL Display に "COMPLETE" と表示されれば処理は完了です。

-Recovery 操作 -

1. Front Panel 上の [MEMORY] と [MENU] ボタンを同時に 3 秒以上押し続けます。
2. FL Display に "MEMORY LOAD" と表示され Recovery 処理が行われます。
3. FL Display に "COMPLETE" と表示され製品は一度 Standby 状態となり復帰後 Recovery 処理が完了します。この時、DUAL BACK UP MEMORY 操作がされてなく、Recovery する Data が Memory されていない場合は FL Display に "NO BACKUP" と表示されます。
また、Main ZONE Volume , ZONE A Volume ,ZONE A Speaker Volume の各 Volume 値についてはこの機能では Backup されずに - ∞で Recovery されます。

・Service 時の注意点

INPUT PWB 上の Flash Rom (IC89) を交換した場合または、DSPCODE を Version Up 等の理由から書き換えた場合は、BackupMemoryとの整合性の為に必ず次の方法でDUAL BACKUPMEMORY の消去を行います。

-Backup Memory の Clear 操作 -

1. Front Panel 上の [MEMORY] と [CLEAR] ボタンを同時に 3 秒以上押し続けます。△2
2. FL Display に "BACKUP CLEAR" と表示され Clear 処理が行われます。
3. L Display に "COMPLETE" と表示されれば処理は完了です。

9. WRITING AND UPDATE SOFTWARE

Software for MAIN CPU, flash ROM for DSP, HDMI CPU can be updated/downloaded. Have update/download application software. ("FDT V4.03", "da708_writer.exe", "FlashSta. exe") There are four mode of download, regarding to the target of software as bellow.

- **Mode 1: Update/Download MAIN CPU's software to internal Flash-ROM**

  This mode is to update/download the software for MAIN CPU.
  The target devise is internal flash ROM of CPU (IC105) on CUP12207Z (HDMI PWB).
  The updating of software takes about 2 minutes and 40 seconds.

- **Mode 2: Update/Download DSP's software to Flash-ROM**

  This mode is to update/download the software for DSP.
  The target devise is Flash-ROM (IC116) on CUP12207Z (HDMI PWB).
  The unit needs to be set writing condition, by three front buttons.
  The updating of software takes about 6 minutes and 30 seconds.

- **Mode 3: Update/Download HDMI CPU's software to internal Flash-ROM**

  This mode is to update/download the software for HDMI CPU.
  The target devise is internal flash ROM of CPU (IC61) on CUP12207Z (HDMI PWB).
  The unit needs to be set writing condition, by three front buttons.
  The updating of software takes about 1 minutes.

- **Mode 4: Update/Download USB CPU’s software to internal Flash-ROM.**

  This mode is to update/download the software for USB CPU. The target devise is internal flash ROM of CPU (IC35) on CUP12211Z (USB PWB).
  The unit needs to be set writing condition, by three front buttons.
  The updating of software takes about 1 minute.

NECESSARY EQUIPMENT

The following items are required for updating/downloading.

Windows PC (OS: Windows2000 or WindowsXP) with Serial port.
RS-232C Dsub-9 pin cable (female to female/straight type)
Update software to MAIN CPU. (FDT V4.03)
Update software to flash ROM for DSP. (da708_writer. exe, etc... in DSP folder)
Update software to HDMI CPU. (FlashSta.exe, etc... in HDMI folder)
Update software to USB CPU. (FlashSta.exe, etc... in USB folder)

Use RS232C Dsub-9 pin cable (female to female/straight type) to connect PC and the RS-232C port in rear panel of the unit, when updating/downloading each of software.

MAIN マイコン、DSP のフラッシュ ROM、HDMI マイコンのソフトウェアは更新、および書き込みが出来ます。

更新および書き込みには書き込み用アプリケーションが必要です。("FDT V4.03", "da708_writer.exe", "FlashSta.exe")
書き込みには下記の 4 つのモードがあります。

・Mode 1: Update/Download MAIN CPU's software to internal Flash-ROM

このモードは MAIN マイコンの更新および書き込み用です。
基板 CUP12207Z (HDMI PWB) の IC105 のマイコン内部のフラッシュ ROM に書き込みます。
書き込みにかかる時間は約 2 分 40 秒です。

・Mode 2: Update/Download DSP's software to Flash-ROM

このモードは DSP のフラッシュ ROM の更新および書き込み用です。
基板 CUP12207Z (HDMI PWB) の IC116 のフラッシュ ROM に書き込みます。
本機のフロントボタン 3 つから書き込みモードにする必要があります。
書き込みにかかる時間は約 6 分 30 秒です。

・Mode 3: Update/Download HDMI CPU's software to internal Flash-ROM

このモードは HDMI マイコンの更新および書き込み用です。
基板 CUP12207Z (HDMI PWB) の IC61 のマイコン内部のフラッシュ ROM に書き込みます。
本機のフロントボタン 3 つから書き込みモードにする必要があります。
書き込みにかかる時間は約 1 分です。

・Mode 4: Update/Download USB CPU's software to internal Flash-ROM

このモードは USB マイコンの更新および書き込み用です。
基板 CUP12211Z (USB PWB) の IC35 のマイコン内部のフラッシュ ROM に書き込みます。
本機のフロントボタン 3 つから書き込みモードにする必要があります。
書き込みにかかる時間は約 1 分です。

必要機器

下記は更新および書き込みに必要な機器です。

Windows PC (OS : Windows2000 またはWindowsXP) で Serial ポートのあるもの
RS-232C ストレートケーブル (9Pin メス -9Pin メス)
MAIN マイコン用書き込みソフトウェア (FDT V4.03、など)
DSP フラッシュ ROM 用書き込みソフトウェア (DSP フォルダ内 da708_writer.exe、など)
HDMI マイコン用書き込みソフトウェア (HDMI フォルダ内 FlashSta.exe, など)
USB マイコン用書き込みソフトウェア (USB フォルダ内 FlashSta.exe、など)

それぞれのソフトウェアを更新および書き込みする場合、RS-232C ケーブルで本機リアパネルの RS232C コネクタと Windows PC の Serial ポートを接続します。

Download Utility (FDT)

[A] SOFTWARE (fdtv403r00.exe) DOWNLOADS AND INSTALLS PROCEDURE

[A-1] DOWNLOADS OF THE SOFTWARE

(Flash Development Toolkit: the rest is FDT)
Download the software for update of the MAIN CPU.

1. Launch the browser.
2. Type the "http://www.renesas.com/" into an address. And click the Go or press the Enter on keyboard of PC.

NOTE : This site is managed by RENESAS technology corp. The following explanation may differ from the actual composition. When different, please proceed alon-with the site composition of RENESAS.

ユーティリティのダウンロード

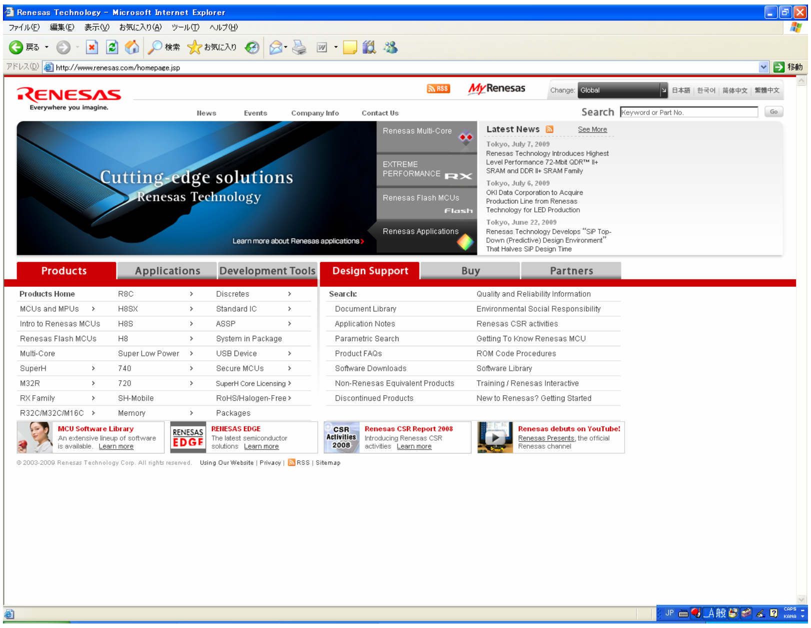
[A] ソフトウェア (fdtv403r00.exe) のダウンロードとインストール手順

[A-1] ソフトウェアのダウンロード

(Flash Development Toolkit: 以下 FDT)
メイン CPU アップデート用ソフトのダウンロード

1. ブラウザ (インターネットエクスプローラー等) を起動します
2. アドレスバーに http://www.renesas.com/ を入力して、キーボードの Enter を押します。

ご注意： このサイトは株式会社ルネサステクノロジーが管理しているため、説明と実際のサイト構成が異なる場合があります。その場合は実際のルネサスのサイト構成に沿って進めて下さい。



A login ID is necessary to download the FDT.
If you have Login ID, please advance to step 8.
If you do not have Login ID, Click the MY RENESAS.

FDT をダウンロードするにはログイン ID が必要です
既にログイン ID をお持ちの方は手順 8 へ進んでください。
ログイン ID を持っていない方は MY RENESAS をクリックしてください。

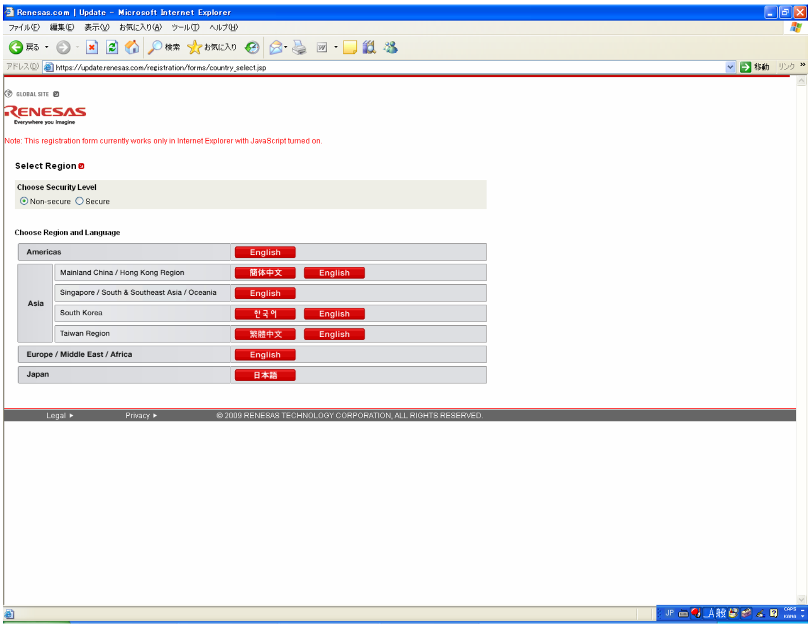
3. Click the "REGISTER NOW!".

3. " 新規登録 " をクリックしてください。



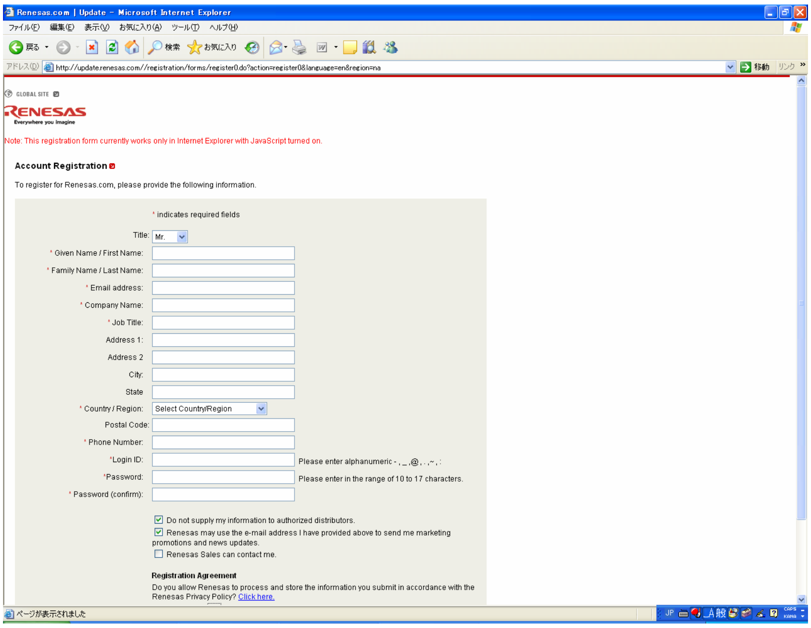
4. Choose Non secure or Secure in Security Level your network environment.
Choose English or another one in region and language.

4. PC のネットワーク環境により、Non secure または Secure を選択してください。
Choose Region and Language から日本語を選択してください。



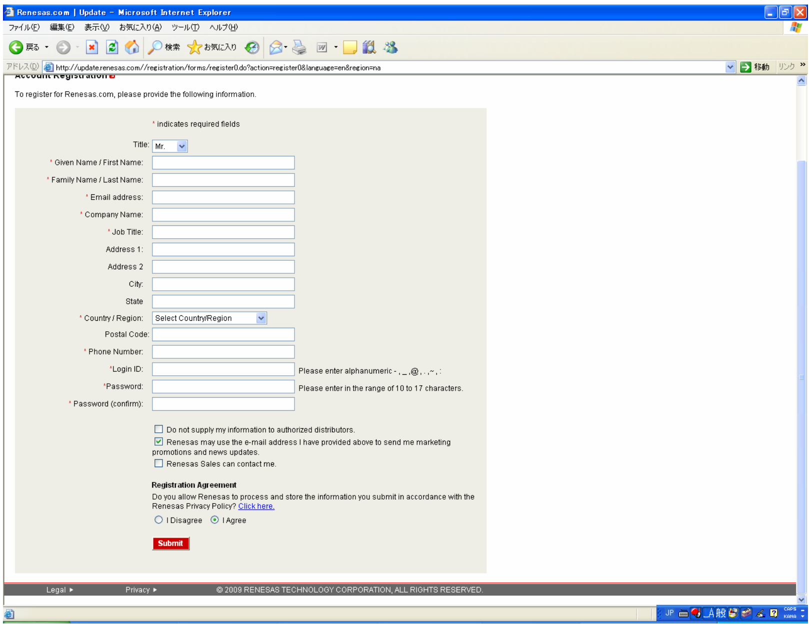
5. Input the each item.
Note: The items displayed by a language and region are different.

5. 各項目を記入します。
言語や地域によって表示は異なります。



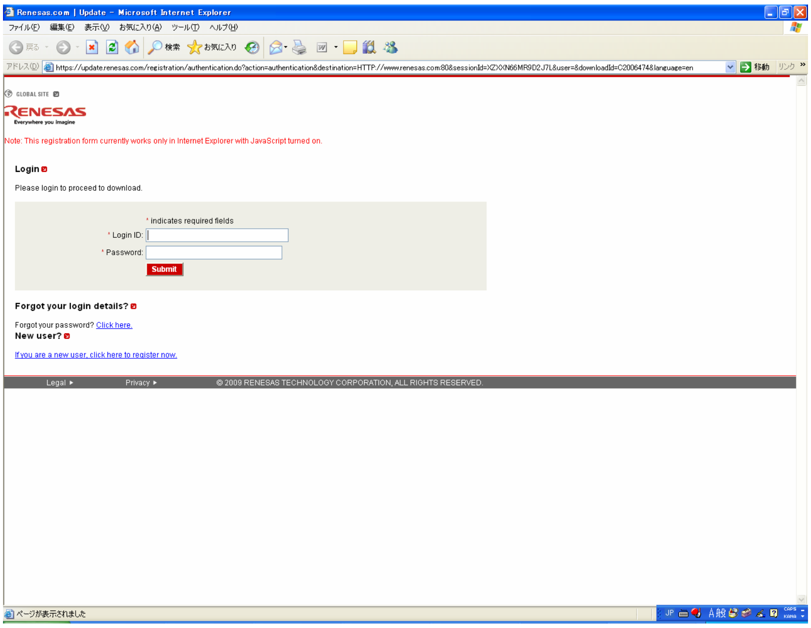
6. If you have inputted the necessary items, click the "I agree", and click "Submit".

6. 必須項目の入力が済んだら "I agree"(同意します) を選択し、"Submit"(送信) をクリックします。



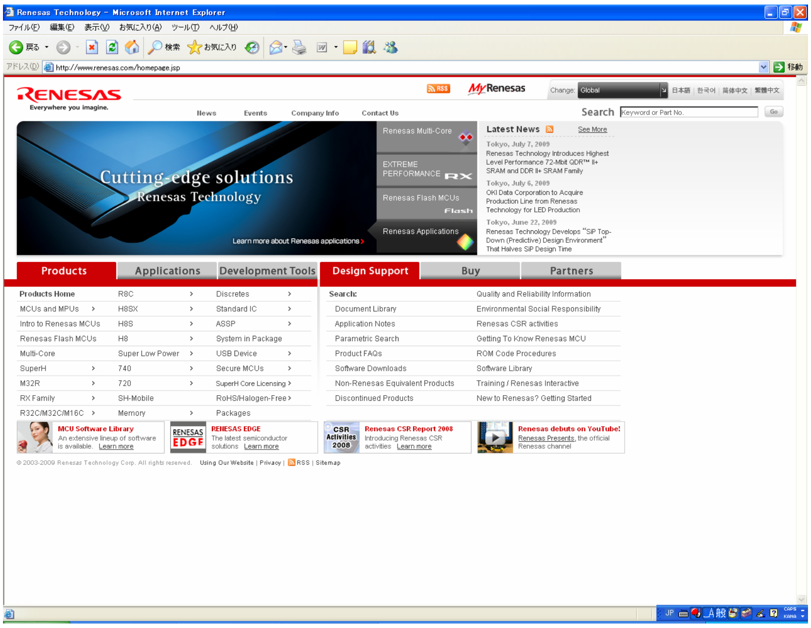
7. Immediately, an e-mail arrives from the renesas. Click the link in the e-mail to go to the registration site, And input the login ID and password. And click the submit.

7. 直ちに、RENESAS から電子メールが届きます。電子メール内にある登録サイトへのリンクをクリックします。ログイン ID とパスワードを入力し "Submit"(送信) をクリックします。



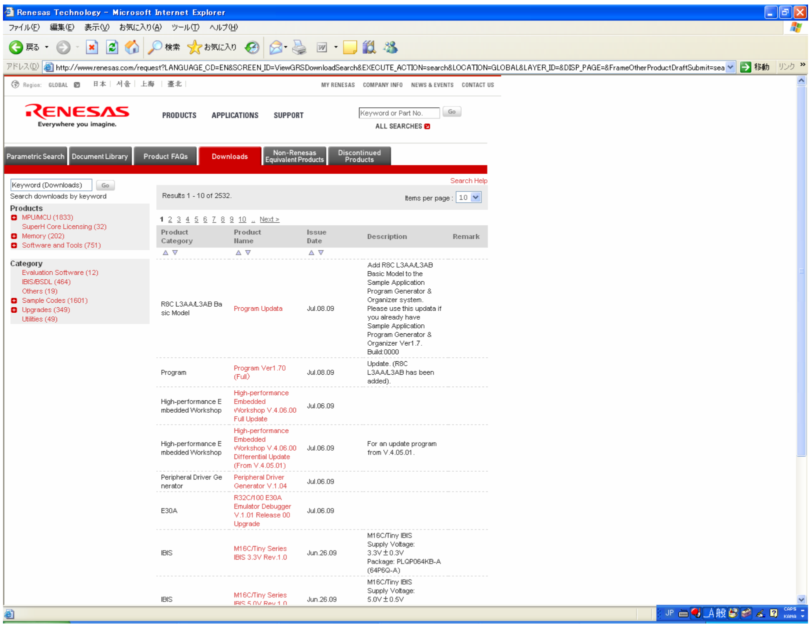
8. Click the Software download in the Design support.

8. Design support 内の Software download をクリックします。



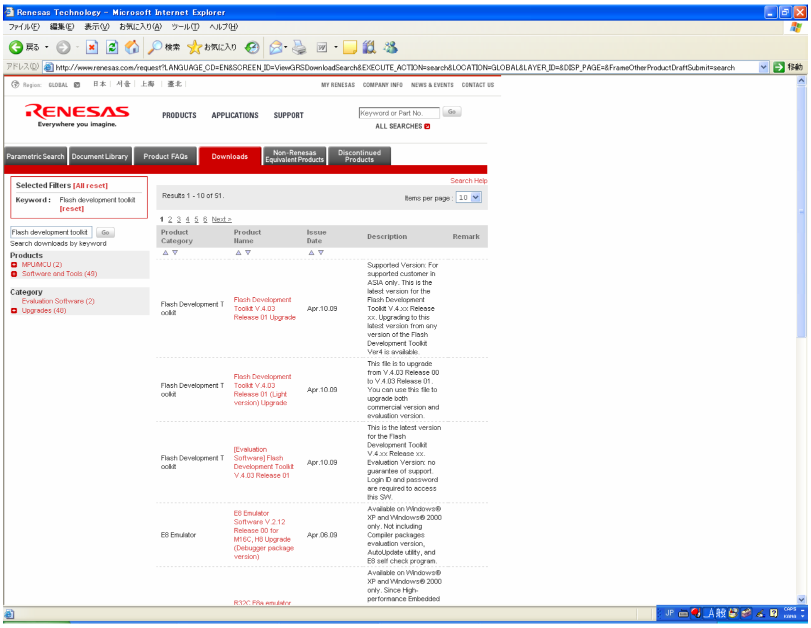
9. Type the "Flash Development toolkit" into the keyword search.

9. キーワードサーチに「フラッシュ開発ツールキット」を入力します。



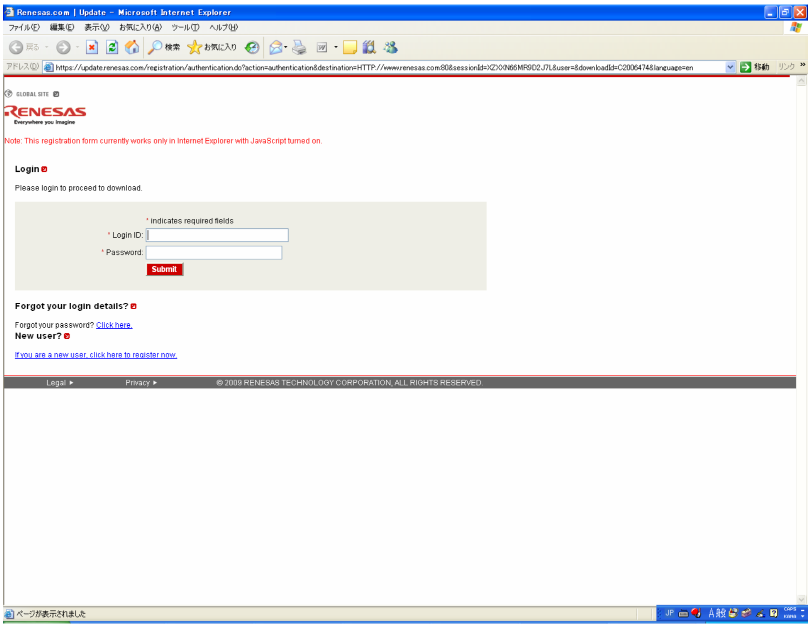
10. Click the [Evaluation Software] Flash Development Toolkit V4.03 Release 01
The latest edition is FDT V4.03 at present. (July. 2009)
It is in FDT V4.03 as follows and explains it.

10.【無償評価版】フラッシュ開発ツールキット V.4.03 Release 01」をクリックします。



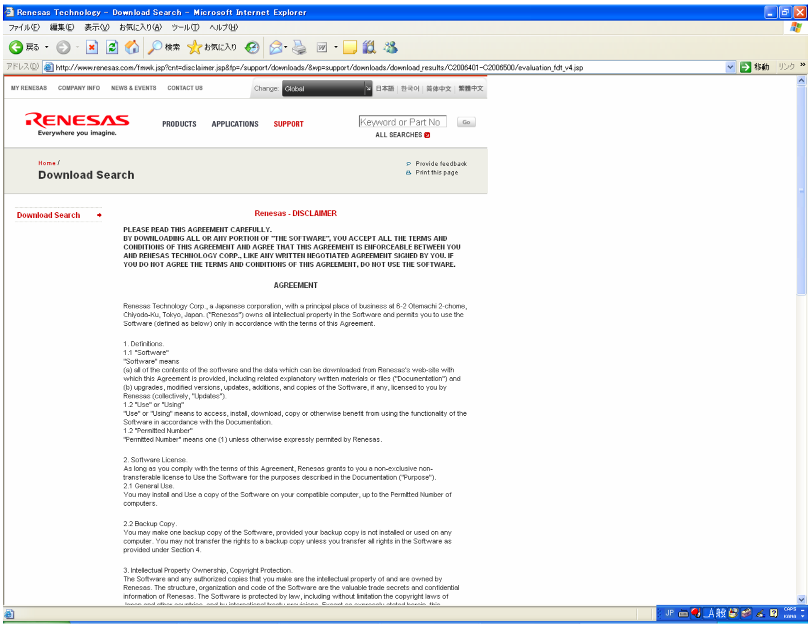
11. Input Login ID and password. And click the submit.

11. ログイン ID とパスワードを入力し、送信をクリックします。



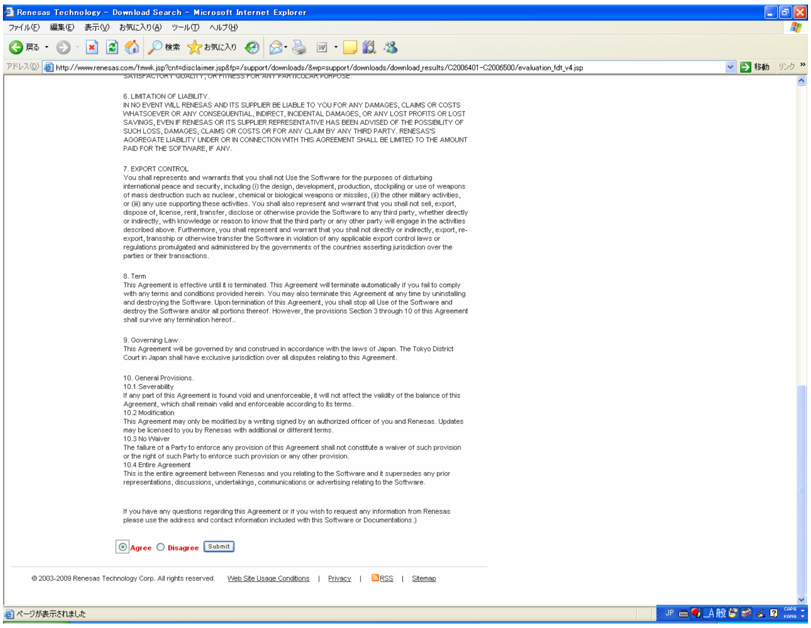
12. Scroll down the page.

12. ページをスクロールします。



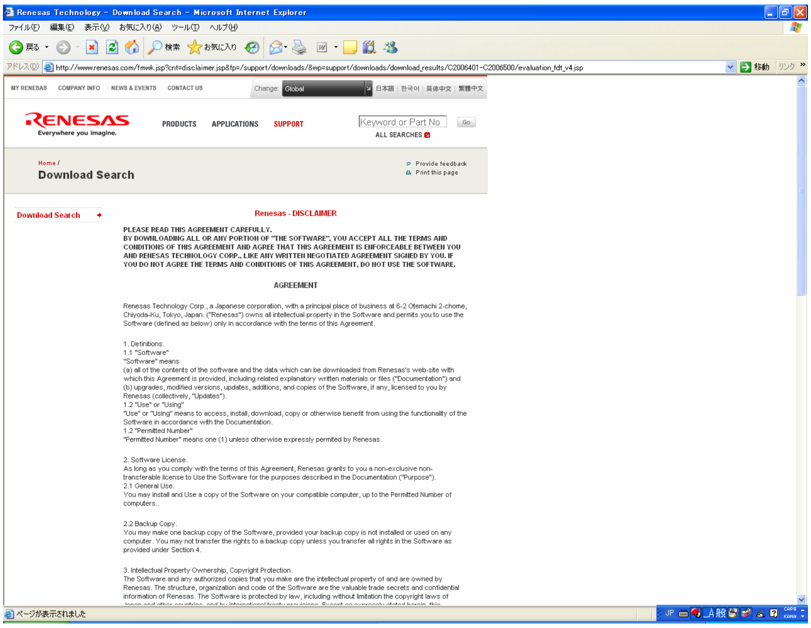
13. Click the Agree, and click the submit.

13. Agree(同意) を選択してから、Submit(送信) をクリックします。



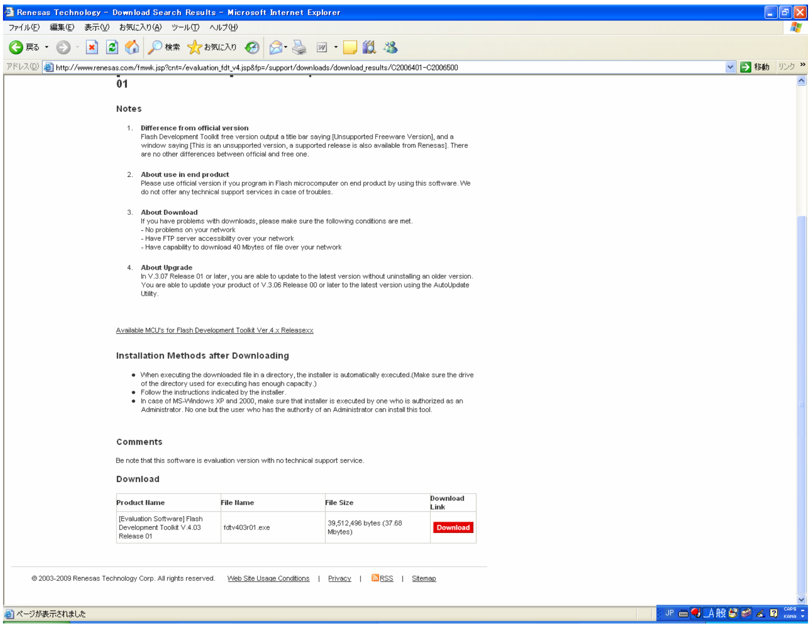
14. Scroll down the page.

14. ページをスクロールします。



15. Click the Download.

15. Download(ダウンロード) をクリックします。



16. Click the Save. Save the fdtv403r00.exe on your PC's hard disc.

NOTE: A file name is change by improvement.

16. Save(保存) をクリックします。Fdtv403r00.exe をパソコンのハードディスクに保存します。

ご注意： 改版によりファイル名は変更されることがあります。

Installs Utility (FDT)

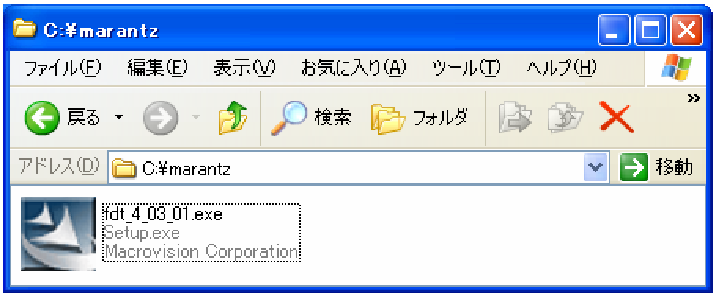
[A-2] [A] INSTALLS OF THE SOFTWARE (Flash Development Toolkit Ver.4.03)

1. Open the folder with the downloaded file.
2. And double click the fdtv403r00.exe

ユーティリティのインストール

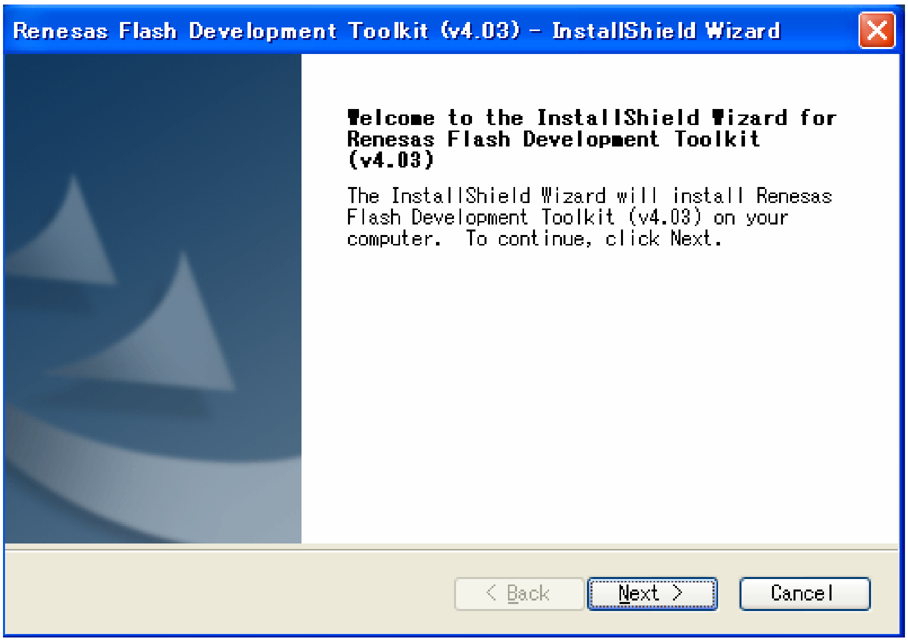
[A-2] [A] ソフトウェアのインストール (Flash Development Toolkit Ver.4.03)

1. ダウンロードしたファイルのあるフォルダを開きます。
2. Fdtv403r00.exe をダブルクリックします。



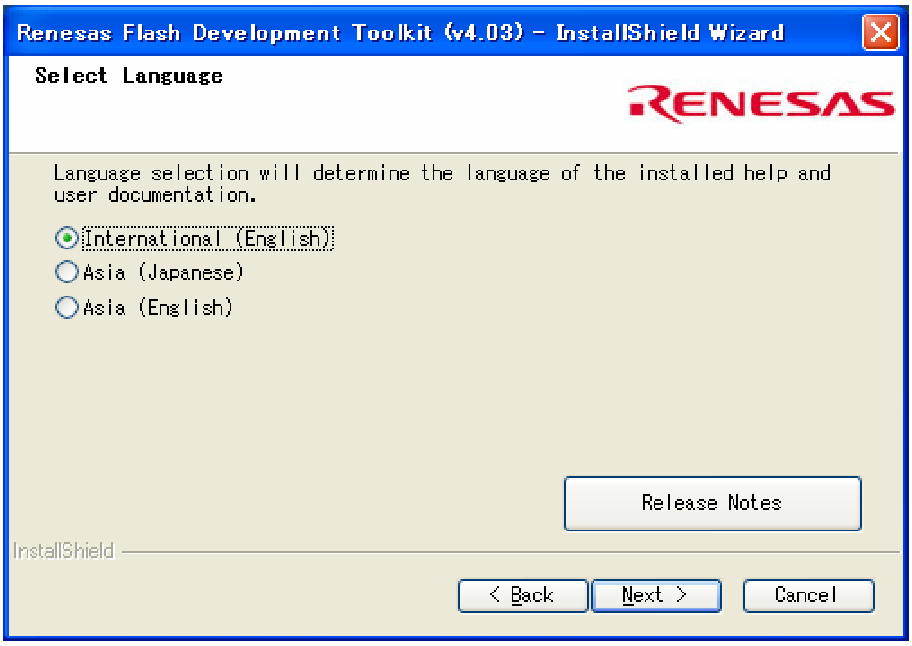
3. Click the Next.

3. Next をクリックします。



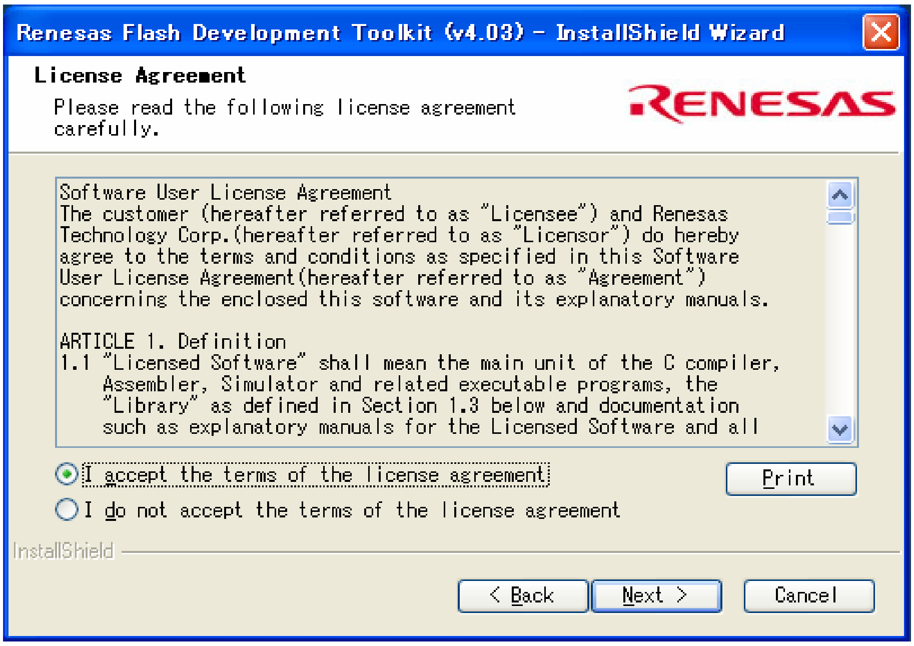
4. Check the International (English),and click the Next.

4. "International (English)" にチェックを入れ、Next をクリックします。



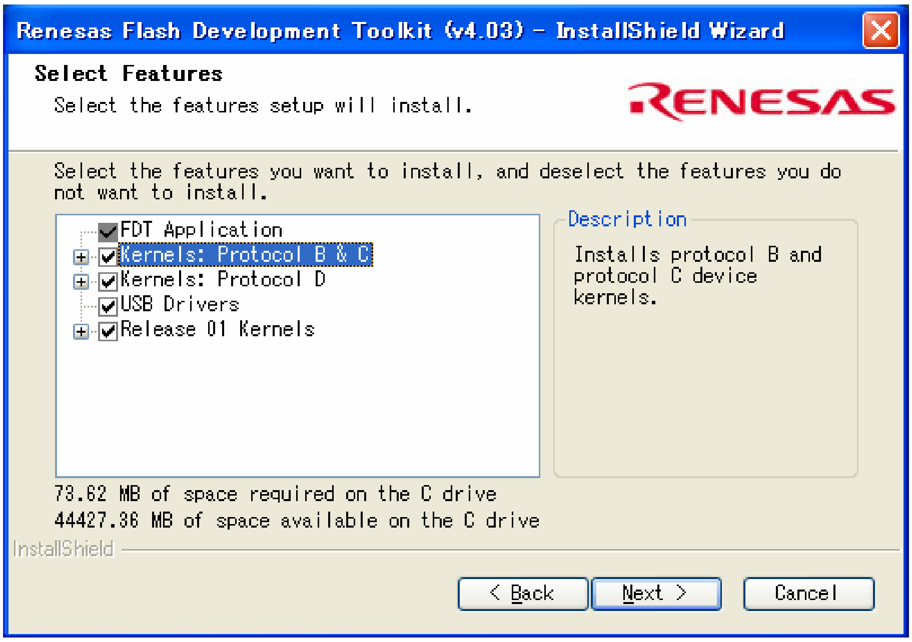
5. Check the I accept the terms of the license agreement, and Click the Next.

5. I accept the terms of the license agreement にチェックを入れ、Next をクリックします。



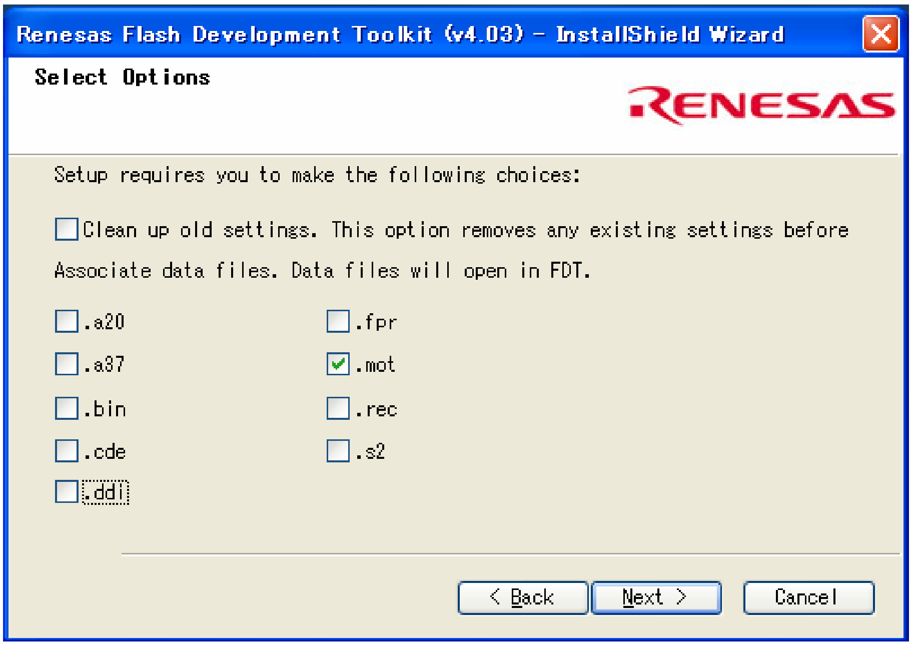
6. Click the next.

6. Next をクリックします。



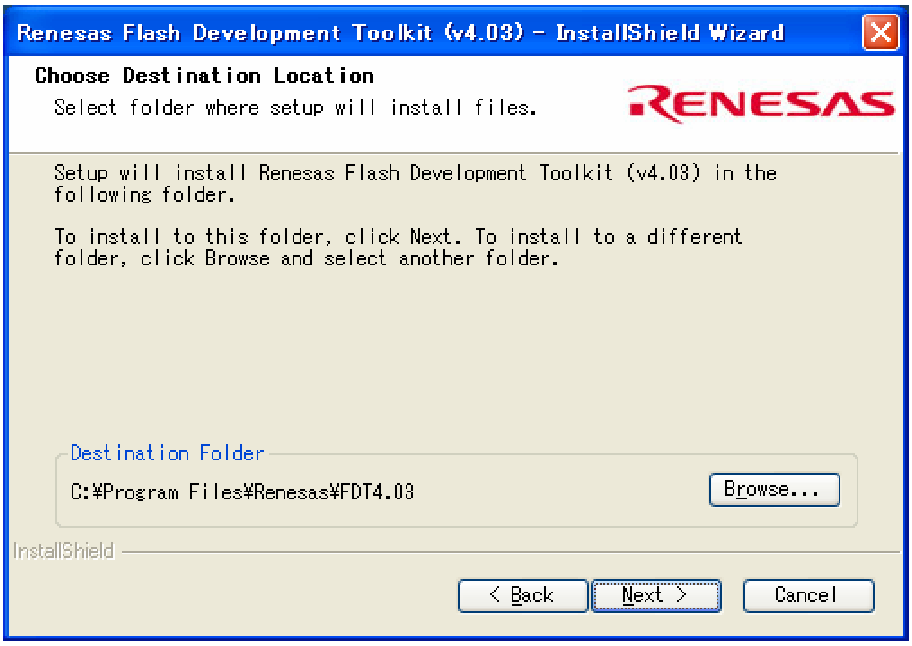
7. Check the mot file type, and click the Next..

7. mot ファイル形式をチェックし、Next をクリックします。



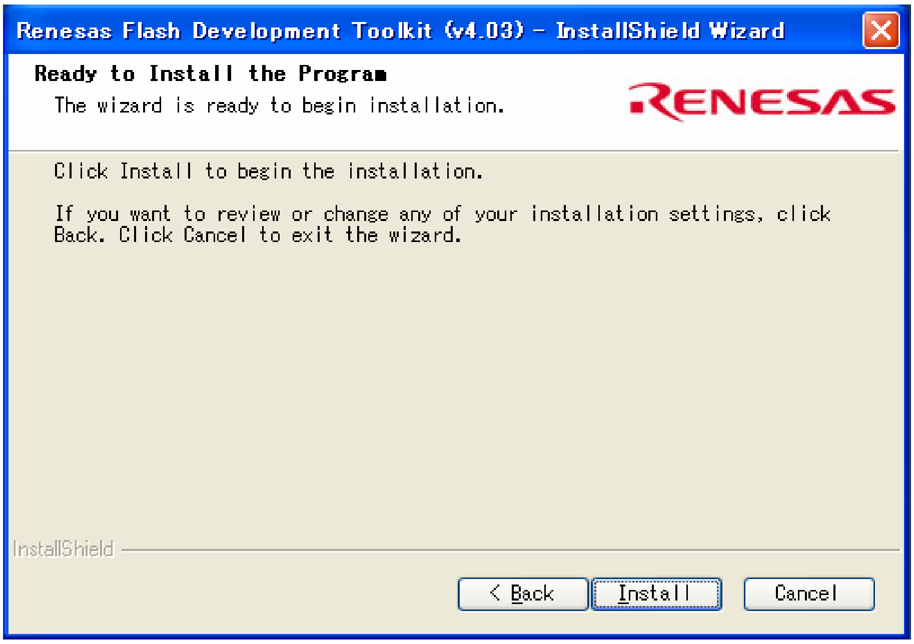
8. Click the Next.

8. Next をクリックします。



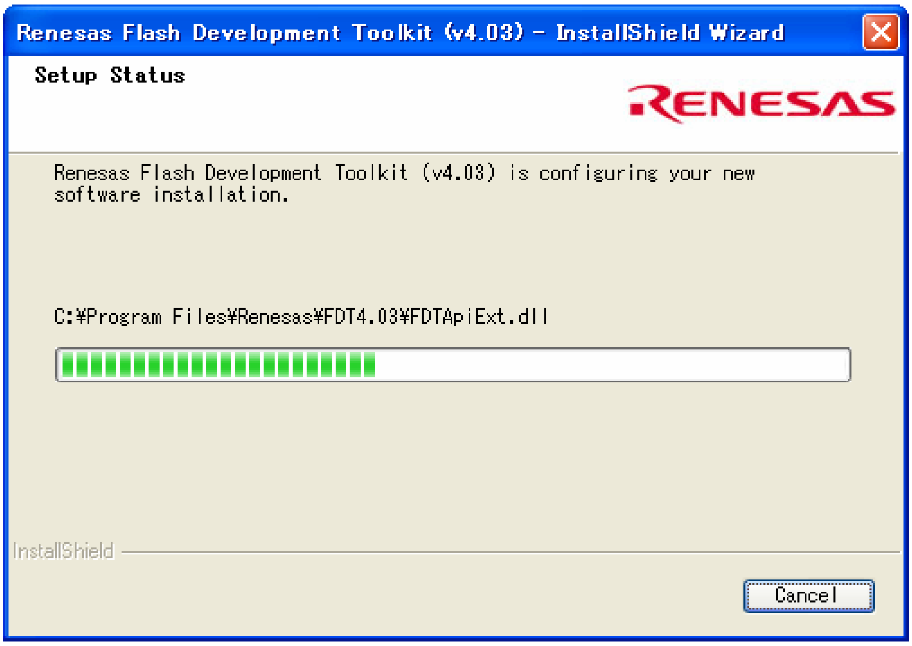
9. Click the Install.

9. Install をクリックします



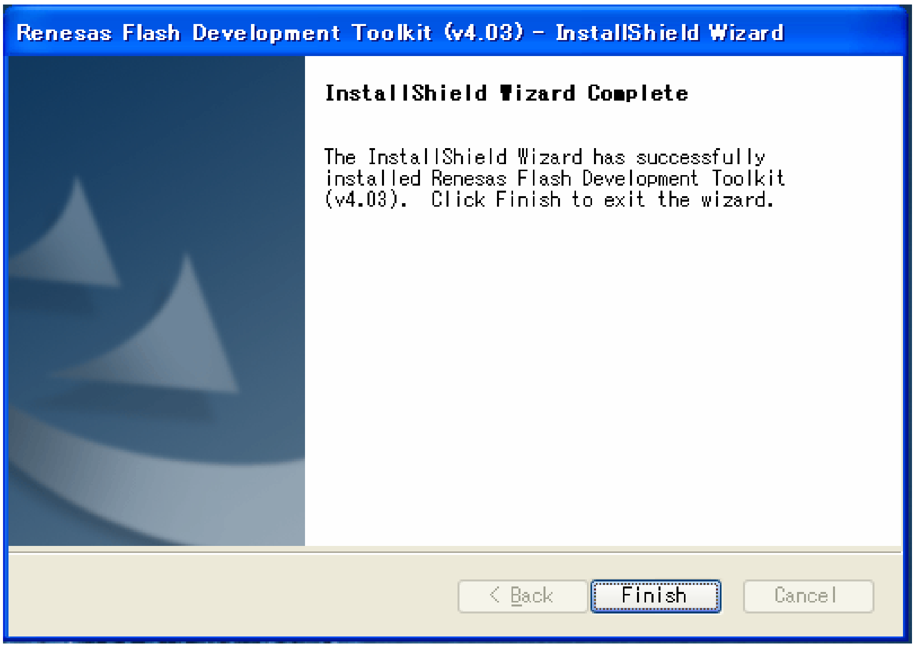
10. The Setup Status bar appears.

10. インストールの状態が表示されます。



11. Click the Finish.

11. Finish をクリックします。



Update Firmware (SR6004 Main FDT)

• Mode 1: Update/Download MAIN CPU's software to internal Flash-ROM

NECESSARY EQUIPMENT

The following items are required for updating/downloading.

- Windows PC (OS: Windows2000 or Windows XP) with Serial port.
  RS-232C Dsub-9 pin cable (female to female/straight type)
  Flash Development Toolkit 4.03 or latest version
  (fdtv403r00.exe or latest version)
  Use RS232C Dsub-9 pin cable (female to female/straight type) to connect PC and the RS-232C port in rear panel of the unit, when updating/downloading MAIN CPU

[M1-1] The writing software setup procedure

1. Launch the Flash Development Toolkit v4.03 (FDT)

   NOTE : Please refer to "[A] SOFTWARE (fdtv403r00.exe) INSTALL PROCEDURE", when you do not install FDT.

2. Click Start, Programs, Renesas, Flash Development Toolkit 4.03 and Flash Development Toolkit 4.03.

ファームウェアのアップデート

・Mode 1: Update/Download software for MAIN CPU. メイン CPU ソフトウェアのアップデート

必要機器

下記はアップデートに必要な機器です

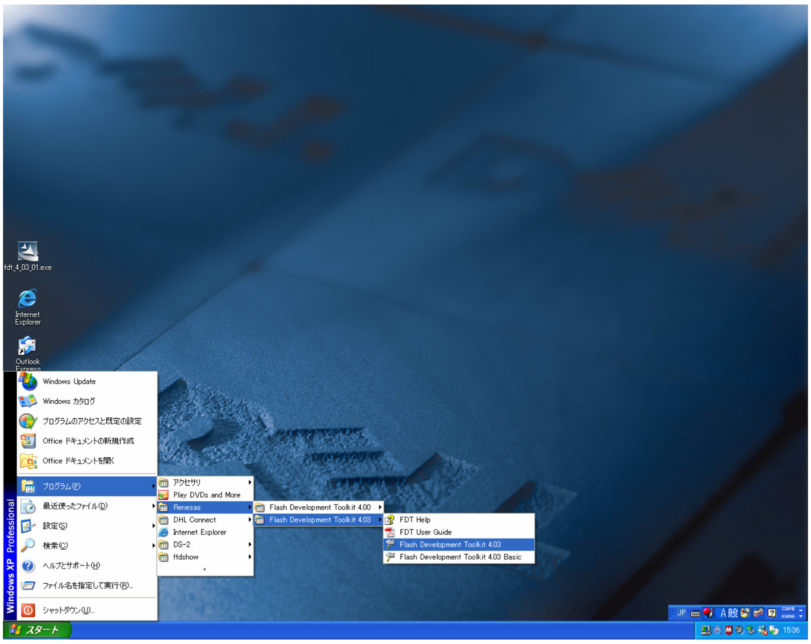
Windows PC(OS: Windows2000 または Windows XP) でシリアルポートを備えたもの
RS232C 用ストレートケーブル (9 ピンメス -9 ピンメス)
Flash Development Toolkit 4.03 または最新版
(fdtv403r00.exe または最新版)
夫々のソフトウェアをアップデートする場合、本機のリアパネルにある RS232C コネクターとパソコンのシリアルポートを接続します

[M1-1] メイン CPU 書き込み用ソフトウェアのセットアップ

1. Flash Development Toolkit v4.03 (FDT) を起動します。

   ご注意： FDT がインストールされていない場合は、[A] ソフトウェアインストール手順を参照して下さい。

2. スタート、プログラム、RENESAS、Flash Development Toolkit 4.03 および Flash Development Toolkit 4.03 をクリックします。

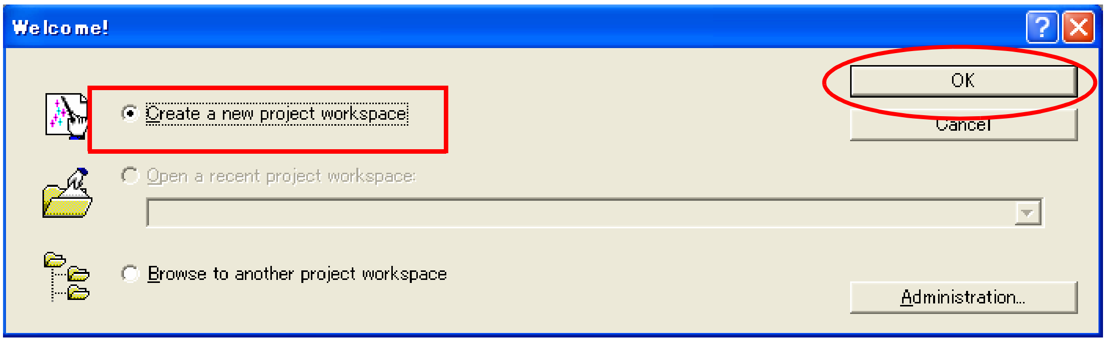


3. Check the Create a new project workspace, and click the OK.

NOTE : It is needs setup for SR6004 When you have already setup, please advance to "[M1-2] Writing Procedure for MAIN CPU".

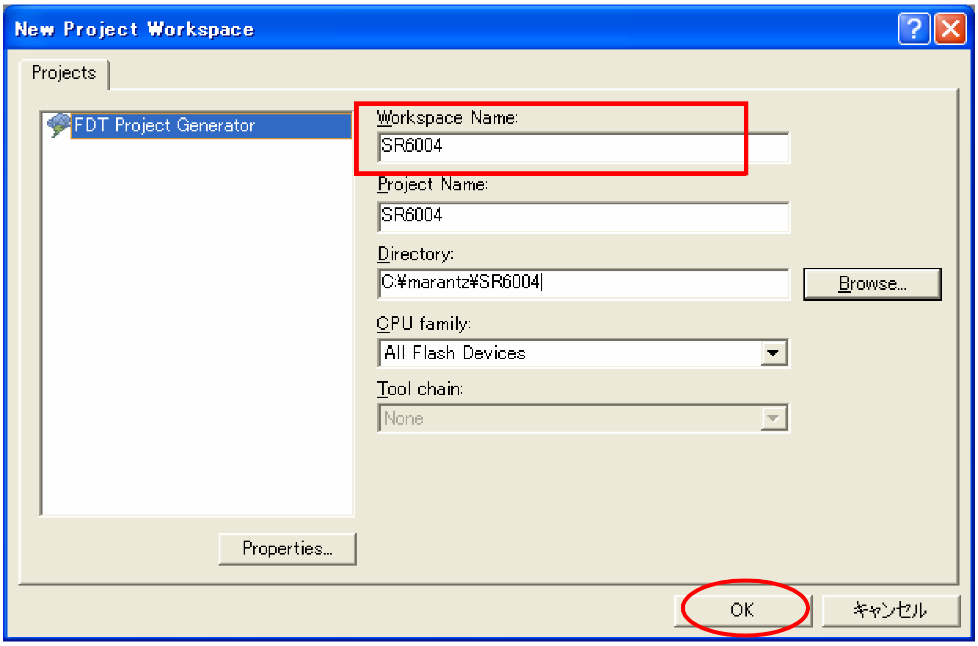
3. Create a new project workspace をチェックし、OK をクリックします。

ご注意： すでに SR6004 用のセットアップが済んでいる場合は、[M1-2] メイン CPU の書き込み手順へ進んでください。.



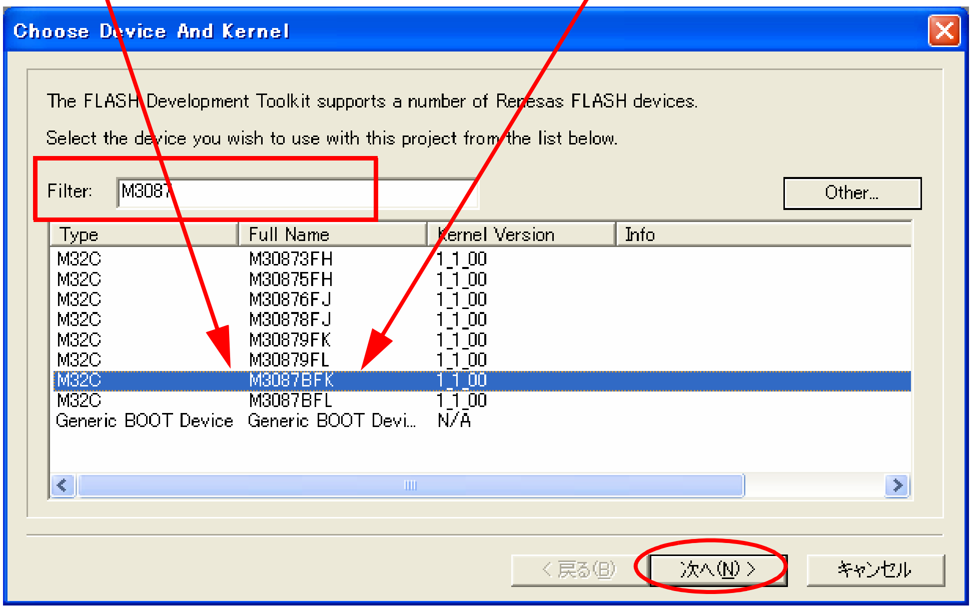
4. SR6004 is inputted into the Workspace Name. (It is simultaneously inputted into Project Name.)
Click the OK.

4. Workspace Name に SR6004 を入力します。(同時に Project Name にも入力されます)
OK をクリックします。



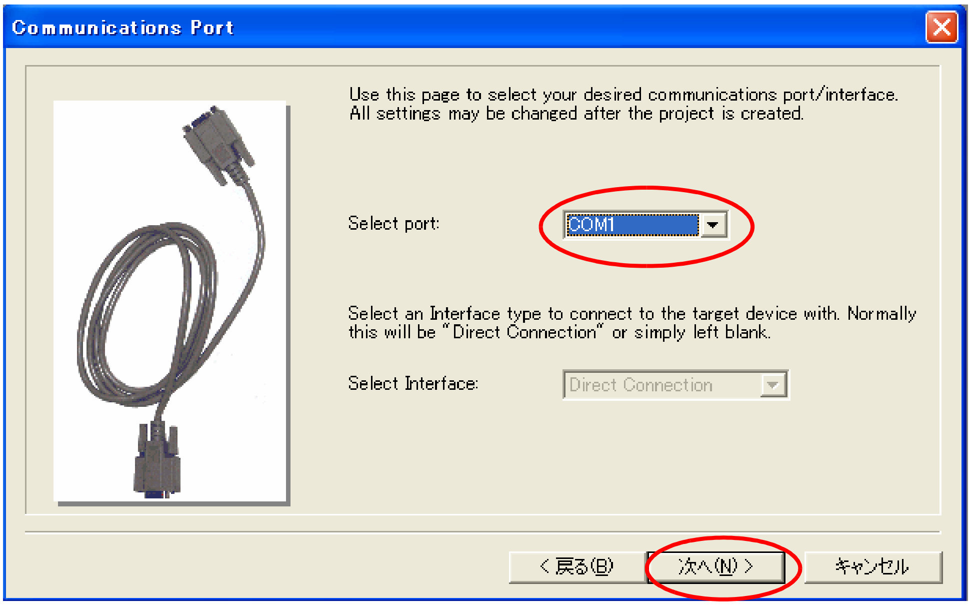
5. Input the Filter "M3087".
Then, selected "M3087BFK " and Click the Next. ⚠

5. Filter に M3087 を入力します。
M3087BFK を選択し Next をクリックします。⚠



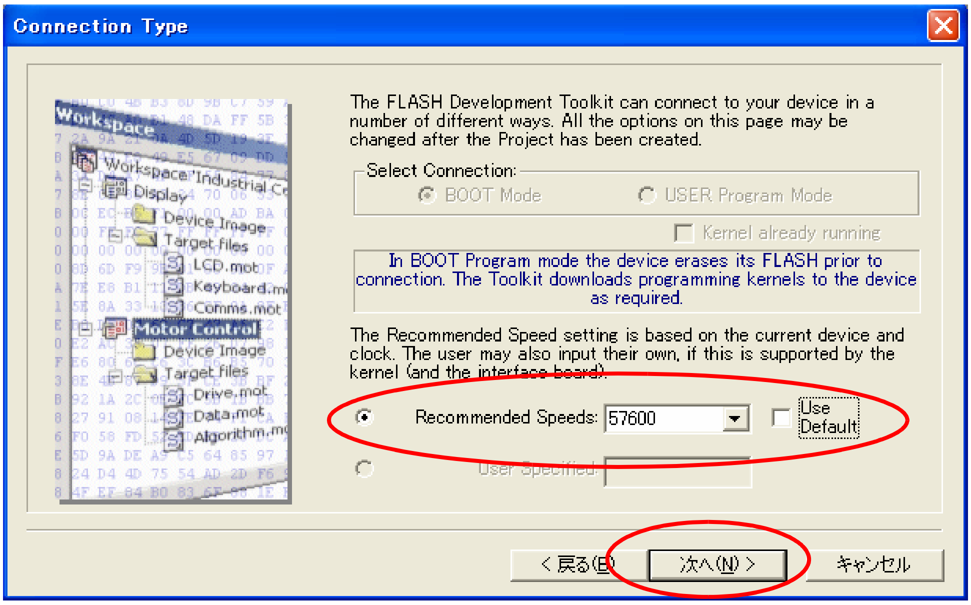
6. Choose the Serial port number in the Select Port. And click the Next.

6. シリアルポート番号を選択し、Next をクリックします。



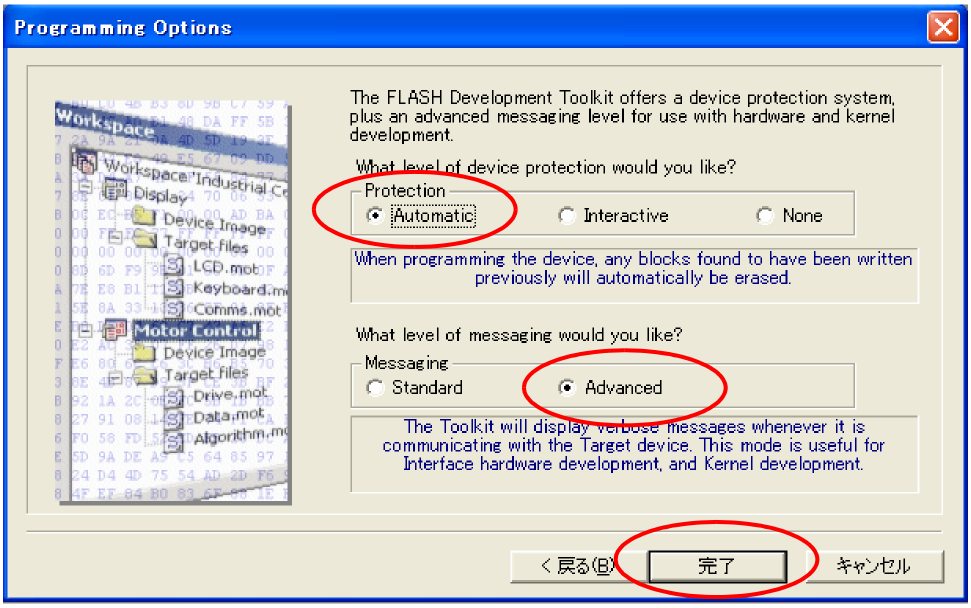
7. Un-check the Use Default, and choose the 57600 in Recommended Speeds. Click the Next.

7. Use Default のチェックを外し、Recommended Speeds として 57600 を選択します。



8. Check the Automatic in Protection. Check the Advanced in Messaging. Click the Finish

8. Protection から Automatic を、Messaging から Advanced にチェックをして、Finish をクリックします。

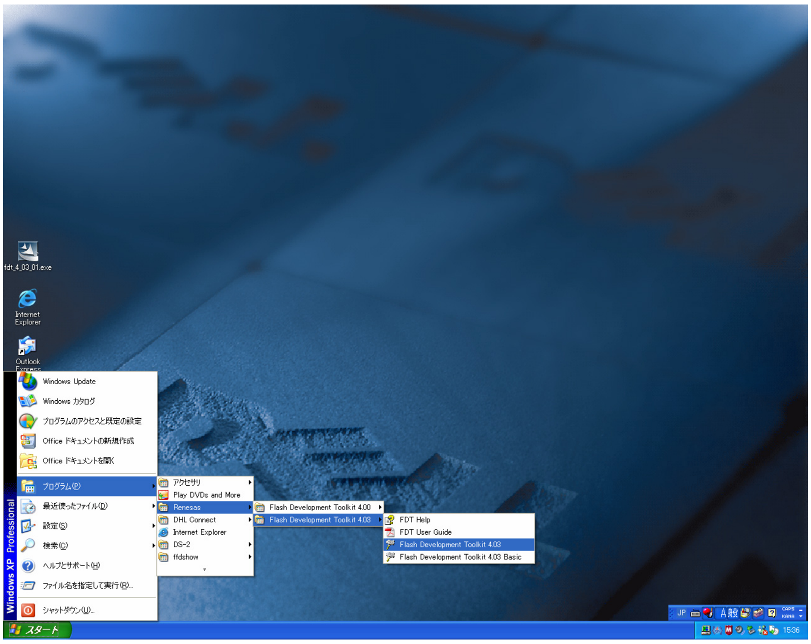


[M1-2] Writing Procedure for MAIN CPU

1. Connect the RS-232C on rear panel of the unit and the Serial Port of windows PC with RS-232C cable.
2. Launch the Flash Development Toolkit (FDT), When FDT is not launch.
   When FDT is already launch, please advance to step No.6.
3. Click Start, Programs, Renesas, Flash Development Toolkit 4.03 and Flash Development Toolkit 4.03.

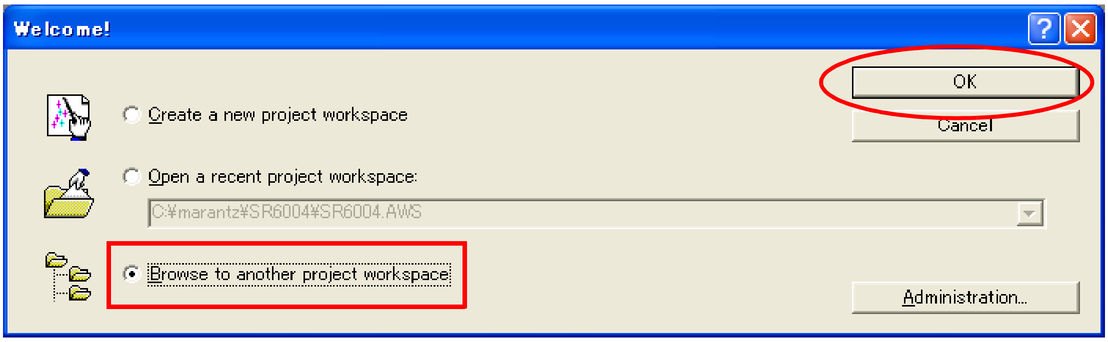
[M1-2] メイン CPU の書き込み手順

1. 本機のリアパネルの RS232C コネクターとパソコンのシリアルポートを RS-232C ケーブルで接続します。
2. Flash Development Toolkit (FDT) を起動します。FDT が既に起動している場合は、6 へ進んでください。
3. スタート、プログラム、RENESAS、Flash Development Toolkit 4.03 および Flash Development Toolkit 4.03 の順にクリックしてください。



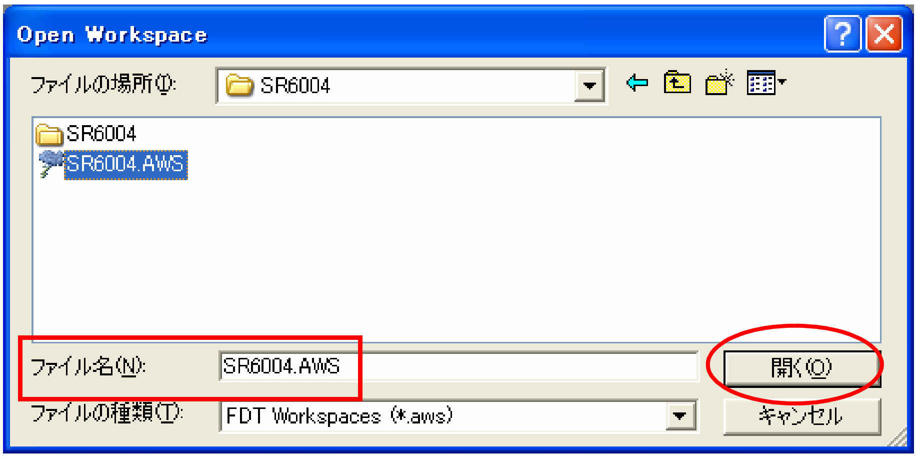
4. Check the Browse to another project workspace, and click OK.

3. Browse to another project workspace をチェックし OK をクリックします。



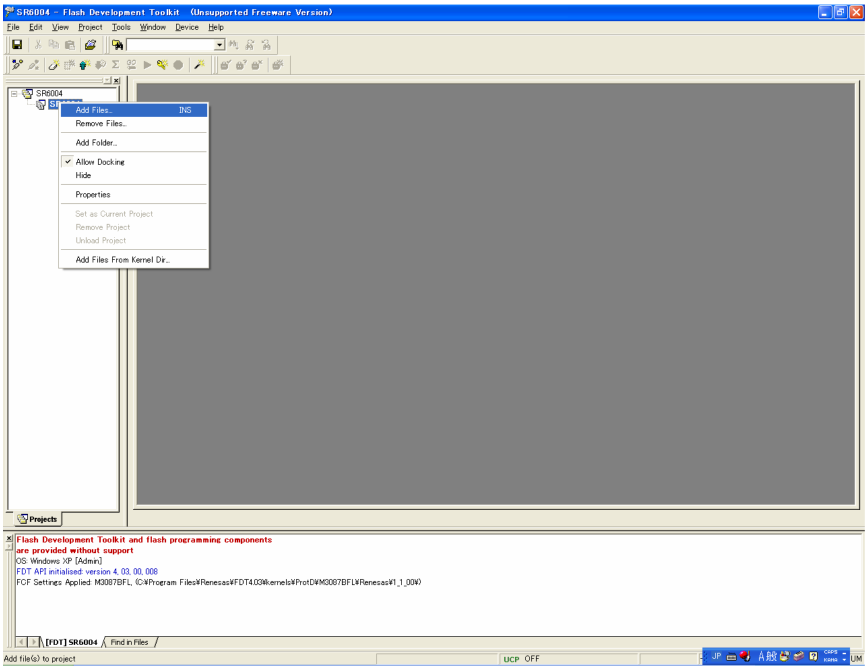
5. Choose SR6004.AWS in SR6004 folder under Workspace folder. And Click the Open.

5. Workspace フォルダーの下にある SR6004 フォルダーの中の SR6004.AWS を選択します。



6. Right button of mouse click on the SR6004, and select the Add Files... in a menu.

6. SR6004 から右クリックして、Add Files…を選択します。

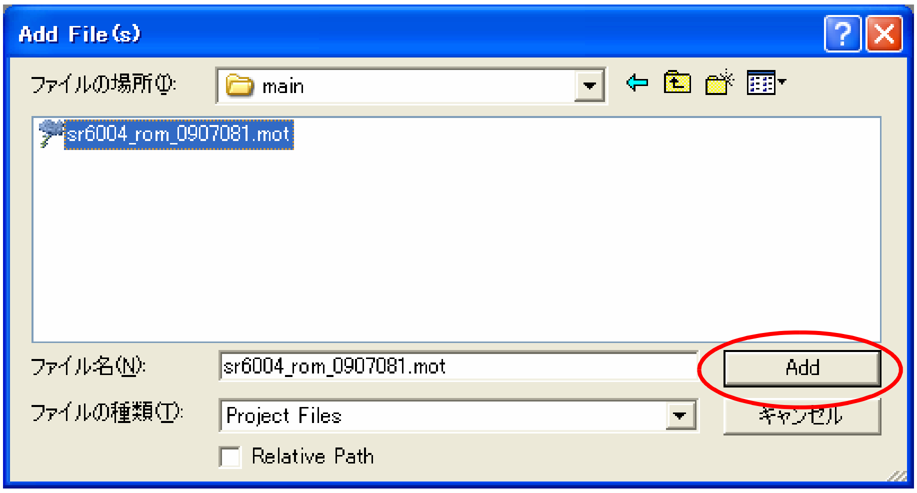


7. Browse and choose the sr6004_rom_yymmddv.mot, and click the Add.

NOTE : The yy is two digits of year. The mm is month. The dd is date. The v is release number.

7. sr6004_rom_yymmddw.mot を選択し、Add をクリックします。

ご注意： yy は西暦下 2 桁、mm は月、dd は日にち、v はリリース番号を表しています。



• Update/Download DSP's software to Flash-ROM

8. Connect RS-232C on the rear panel of the unit and Serial Port of windows PC with RS-232C cable.
9. Insert a thin rot to the hole near the RS-232C terminal and push the switch inside to turn on the switch.

・Update/Download DSP's software to Flash-ROM

8. 本機のリアパネルの RS232C コネクターとパソコンのシリアルポートを RS-232C ケーブルで接続します。
9. 本機リアパネルの RS232C コネクター近くにある穴に細い棒を挿して内部のスイッチを押します。



Hole of rear panel

10. Connect the mains cord into the unit.
    And press the POWER ON/OFF button for turn on the unit. (N, K version)

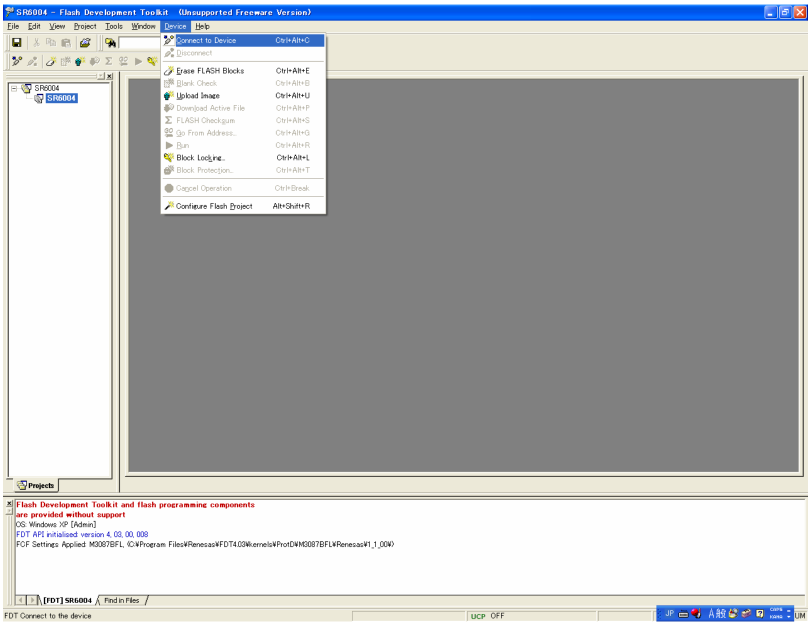
NOTE : When the unit is into boot mode, STANDBY LED is not lights.

11. Click the Device in the menu bar and select the Connect to Device.

10. 本機に電源コードを接続します。
    POWER ON/OFF ボタンを押して本機の電源を入れます。(N、K バージョンのみ)

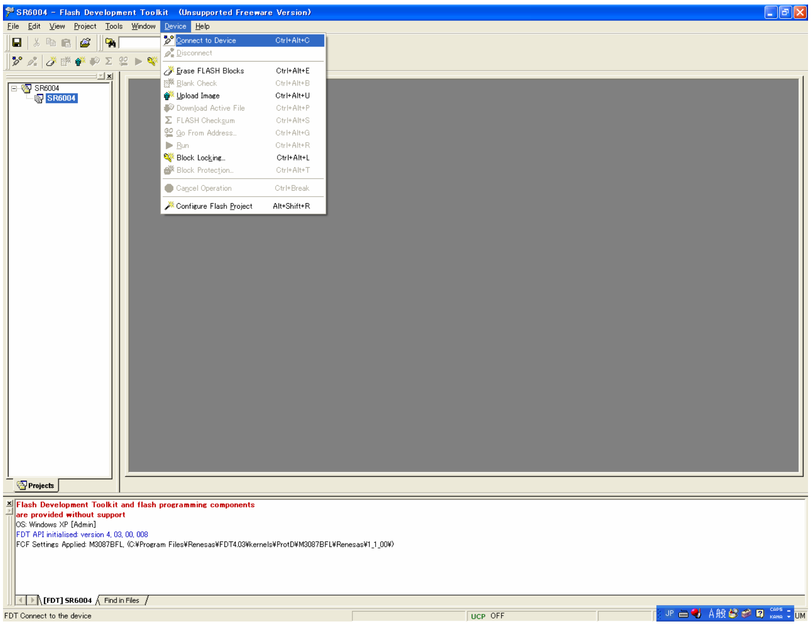
ご注意： このとき本機はブートモードになりますが、STANDBY インジケーターは点灯しません。

11. メニューバーから Device をクリックして Connect to Device を選択します。



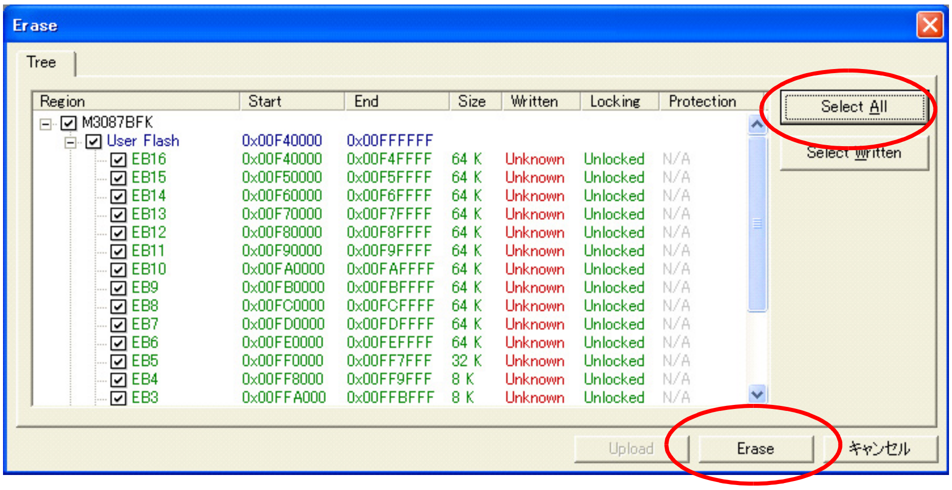
12. Click the Device in the menu bar and select the Erase FLASH Blocks.

12. メニューバーから Device をクリックし、Erase FLASH Blocks を選択します。



13. Click the Select All and Erase.

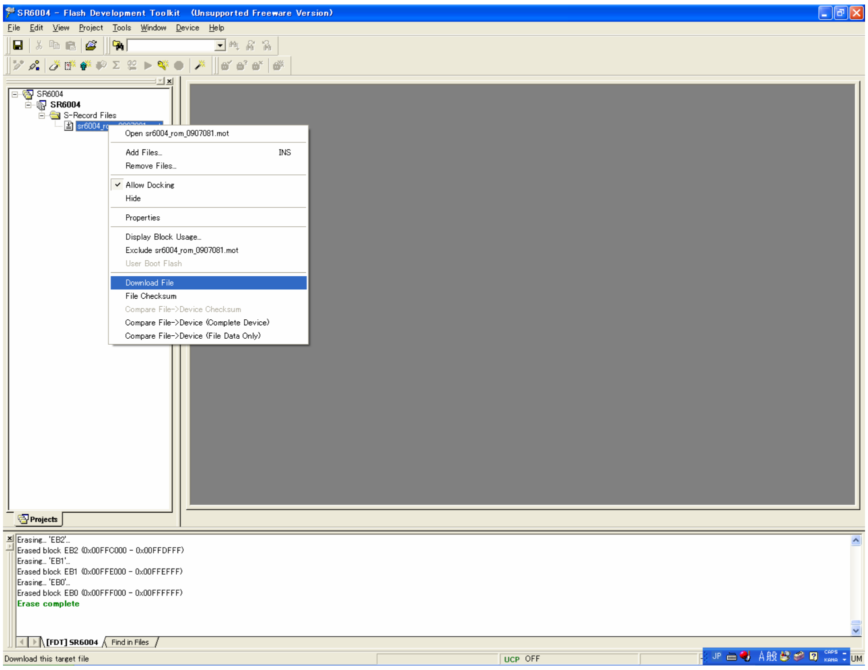
13. Select All と Erase をクリックします。



⚠2

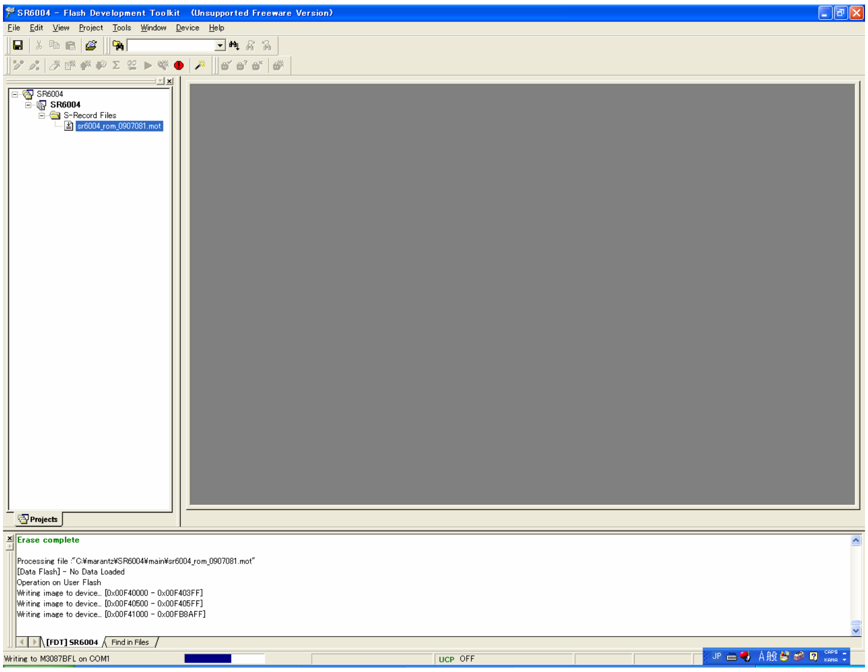
14. Press right button of mouse on the sr6004_rom_yymmddv.mot, and select the Download File in a menu.

14. sr6004_rom_yymmddv.mot の上からマウスを右クリックし、メニューから Download File を選択します。



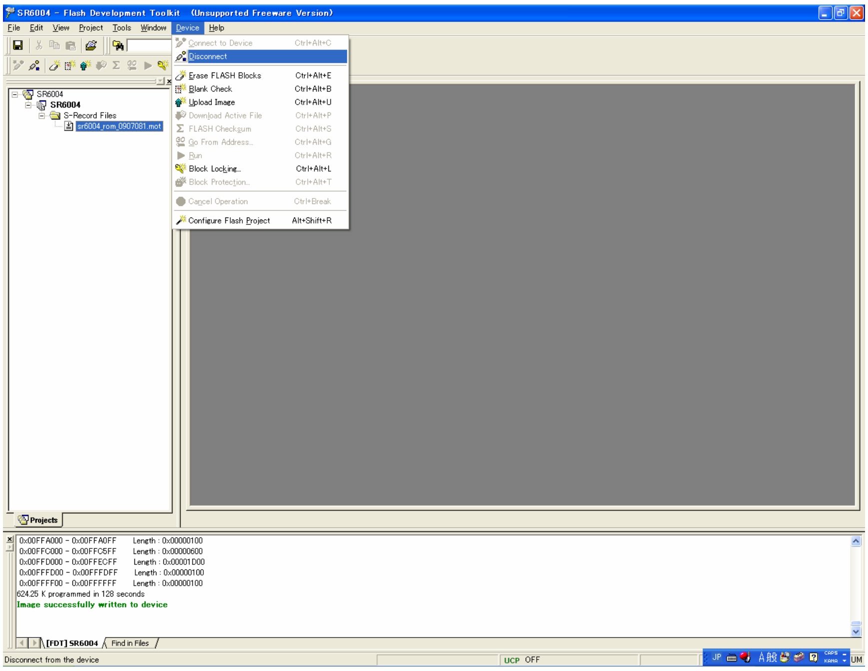
15. Software is written into the MAIN CPU. The writing of software takes about 2 minutes.

15. メイン CPU にソフトウェアが書き込まれます。書き込みには約 2 分かかります。



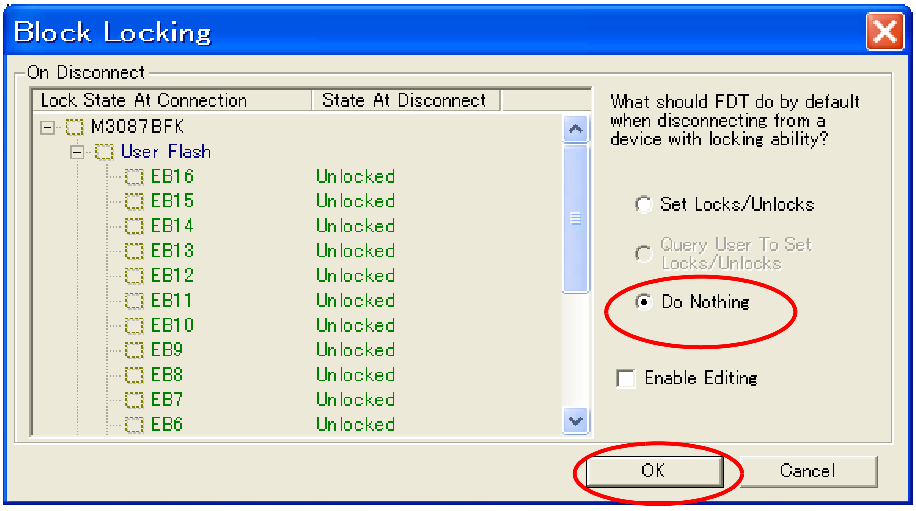
16. Click the Device in the menu bar and select the Disconnect.

16. メニューバーから Device をクリックし、Disconnect を選択します。



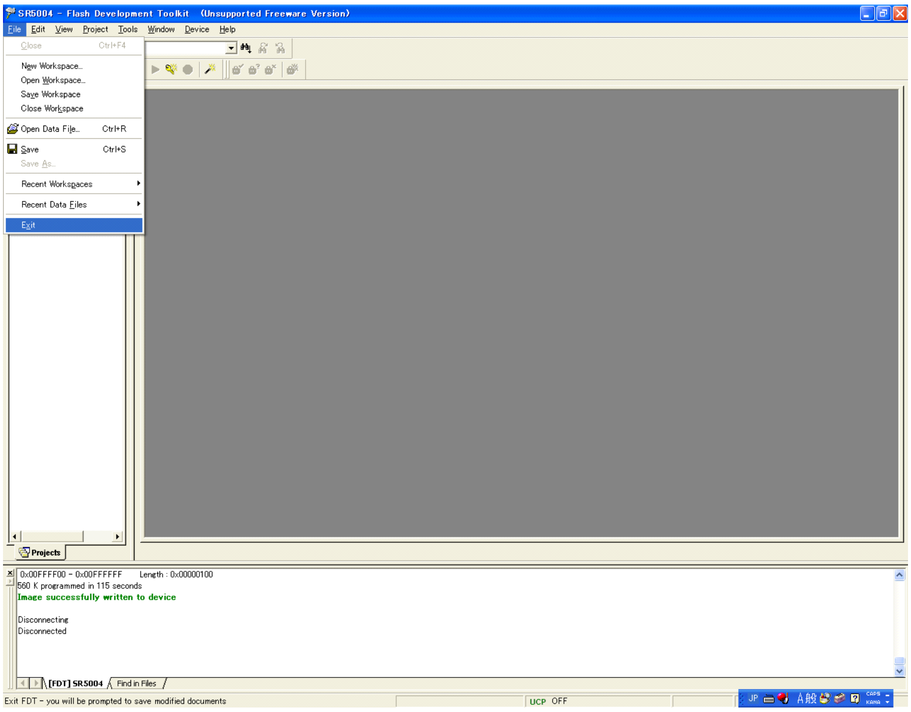
17. Click the OK.

17. OK をクリックします。



18. Click the File and select the Exit in menu.

18. File をクリックし、メニューから Exit を選択します。



19. Press the POWER ON/OFF button for turn off the unit. (N and K version).
20. Disconnect the mains cord and RS-232C cable from the unit.
21. Insert a thin rot to the hole and push the switch inside to turn off the switch.

19. POWER ON/OFF ボタンを押して本機の電源を切ります。(N,K バージョン)
20. 本機から電源コードと RS-232C ケーブルを外します。
21. 穴に細い棒を差し込み、内部のスイッチを押して書き込みモードを解除します。

MAIN CPU Version

1. Connect the mains cord into the unit.
2. Press the POWER ON/STANDBY or POWER ON/OFF button for turn on the UNIT.
3. Press the AUTO, EXIT and CLEAR buttons simulta-neously more then 3 seconds.
4. The FL display shows "SERVICE MODE" and the model name for 2 seconds.

メイン CPU バージョン

1. 本機に電源コードを接続します。
2. POWER ON/STANDBY または POWER ON/OFF ボタンを押して電源を入れます。
3. AUTO, EXIT および CLEAR ボタンを同時に 3 秒以上押します。
4. 本機の FL ディスプレイに SERVICE MODE と機種名が表示されます。

S	E	R	V	I	C	E		M	O	D	E		
				S	R	6	0	0	4				

5. Press the [ENTER] button, The FL display changes as follows .

   MAIN CPU Version → Serial No. of unit → TI DSP Code B1 Version → TI DSP Code B2 Version → HDMI CPU Version→USB CPU Version→FL Test 1 →FL Test 2→FL all clear → Normal operation (Exit Service Mode)

5. ENTER ボタンを押すと FL ディスプレイの表示が下記の通りに変化します

   MAIN CPU Version → Serial No. of unit → TI DSP Code B1 Version → TI DSP Code B2 Version → HDMI CPU Version → USB CPU Version → FL Test 1 → FL Test 2 → FL all clear → Normal operation (Exit Service Mode)

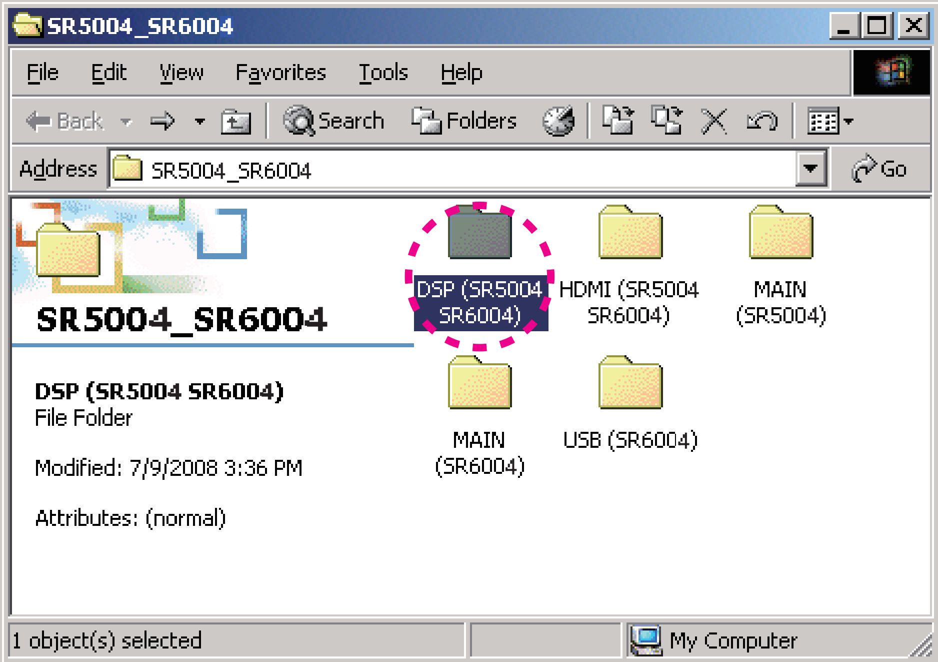
MAIN CPU Version

V	0	9	0	7	2	3		1	N				
	Year		Month		Date			Version	Destination				

Mode 2: Update/Download DSP's software to Flash-ROM

Update/Download Software for DSP (Mode 2)

1. Put the "DSP (SR5004 SR6004)" folder into anywhere on your PC's hard disc.



2. Connect the RS-232C on rear panel of the unit and the Serial Port of windows PC with RS-232C cable.
3. Connect the mains cord into the unit.
4. Press the POWER ON/OFF (STANDBY) button for turn on the unit.
5. Press the ENTER, CLEAR and BAND buttons simultaneously more than 3 seconds to turn the unit into Loading Mode.
6. The FLD shows "SELECT MAIN" after showed "LOADING MODE".
7. Turn the INPUT SELECTOR to change display from "SELECT MAIN" to "SELECT DSP" on FLD.
8. Press the ENTER button.
9. "SELECTED : DSP" shows on the FLD.

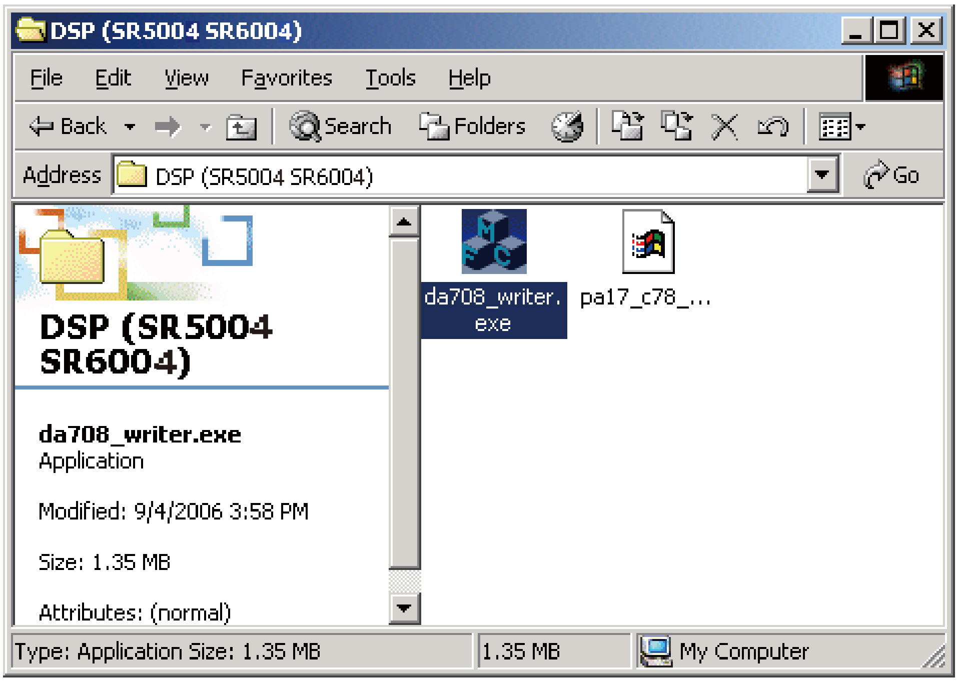
Mode2: Update/Download DSP'ssoft wareto Flash-ROM

Update/Download Soft warefor DSP (Mode2)

1. "DSP(SR5004 SR6004)"フォルダをPCの任意のフォルダにコピーします。
2. 本機のリアパネルにあるRS-232CコネクタとWindows PCのSerialポートをRS-232Cケーブルで接続します。
3. 本機に電源ケーブルを差します。
4. POWER ON/OFF (STANDBY)ボタンを押し、本機の電源を入れます。
5. ENTER, CLEAR, BANDの3つボタンを同時に3秒以上押し続け、本機をローディングモードにします。
6. FLに"LOADING MODE"と表示された後、"SELECT MAIN"と表示されます。
7. 本機のINPUT SELECTORを回して、FLの表示を"SELECT MAIN"から"SELECT DSP"に換えます。
8. ENTERボタンを押します。
9. FLに"SELECTED : DSP"と表示されます。

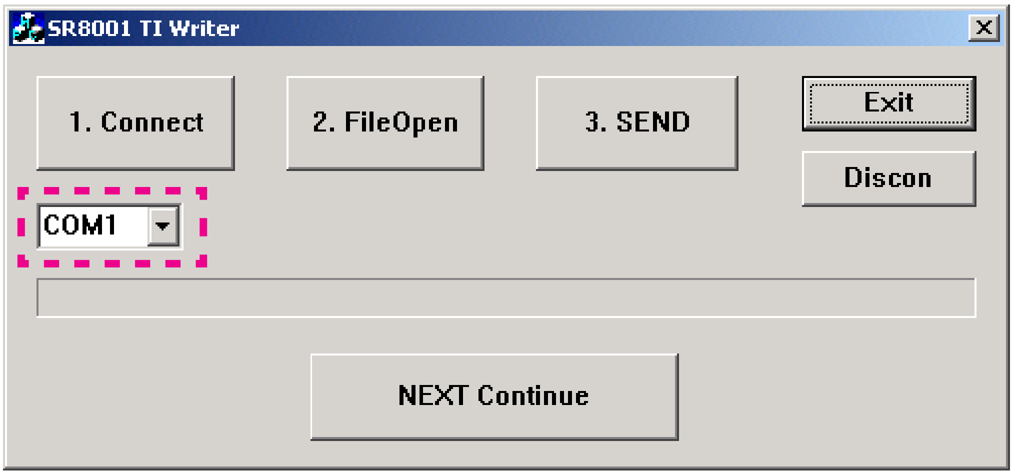
10. Double click the da708_writer.exe. And launch the SR8001 TI Writer.

10. da708_writer.exeをダブルクリックし、SR8001 TI Writerを起動します。



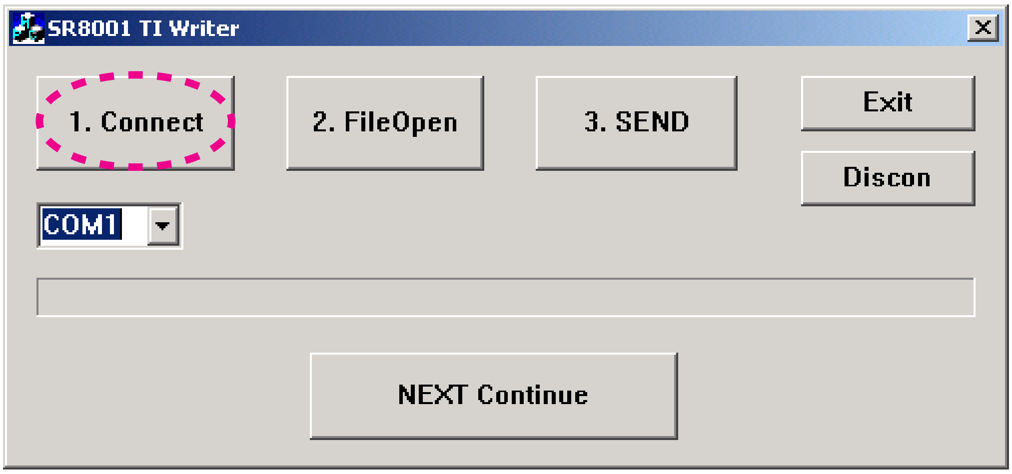
11. Choose the **COM Port number**.

11. 使用する**COMポート番号**を選択します。



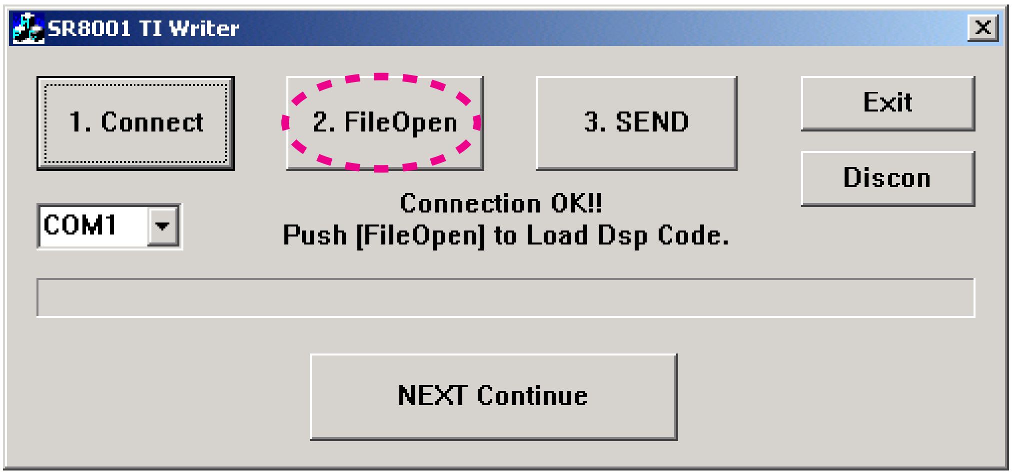
12. Click the **Connect**.

12. **Connect**をクリックします。



13. "Connection OK!!" appears on SR8001 TI Writer. And click the **FileOpen**.

13. SR8001 TI Writer上に"Connection OK!!"と表示されたら、**FileOpen**をクリックします。

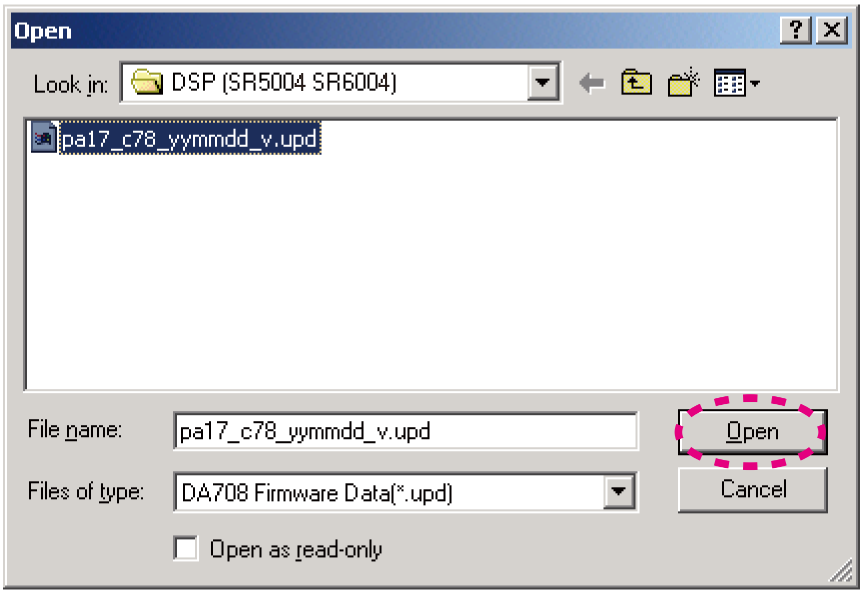


14. Choose the pa17_c78_yymmdd_v.upd. And click the **Open**.

NOTE : The yy is two digits of year. The mm is month. The dd is date. The v is release number.

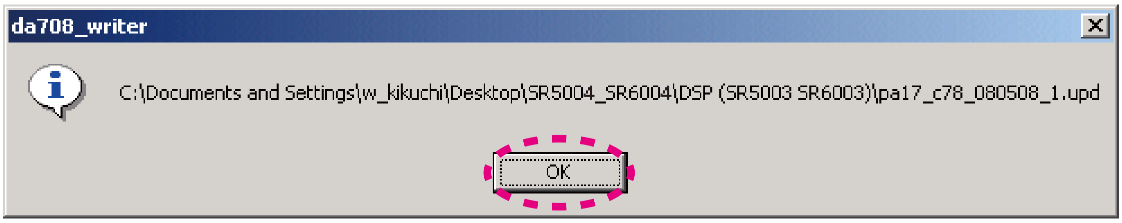
14. pa17_c78_yymmdd_v.updを選択し、**Open**をクリックします。

注意 : yyは年の下二桁、mmは月、ddは日、vはリリース番号



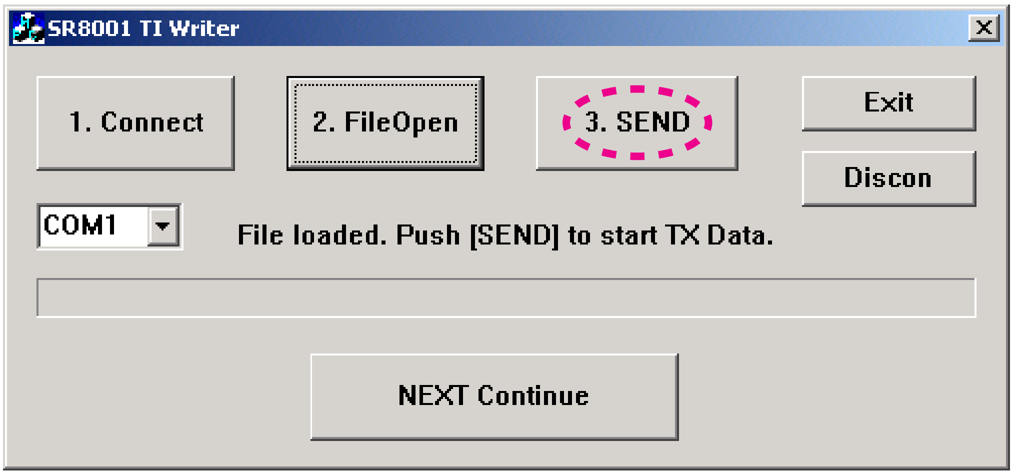
15. Click the **OK**.

15. **OK**をクリックします。



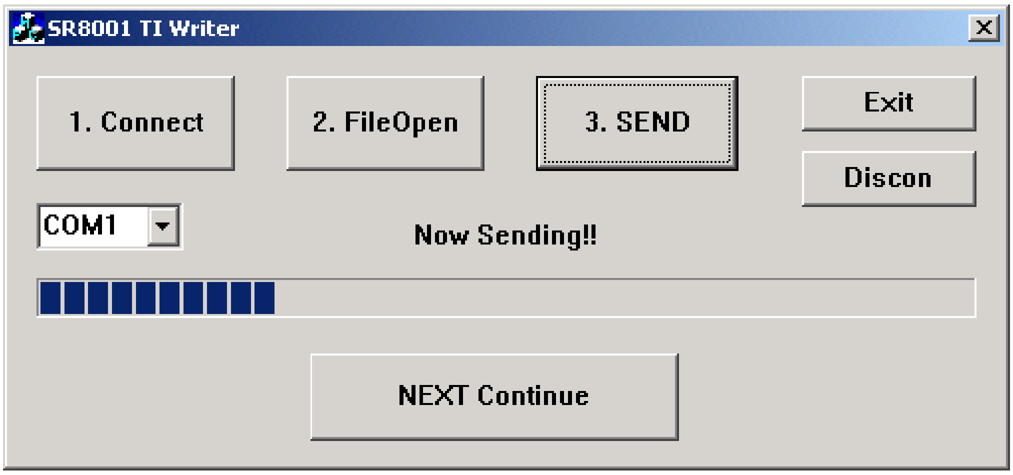
16. Click the **SEND**.

16. **SEND**をクリックします。



17. Software is written into the DSP Flash ROM.
The writing of software takes about 6 minutes and 30 seconds.

17. ソフトウェアがDSPフラッシュROMに書き込まれます。
書き込みにかかる時間は約6分30秒です。



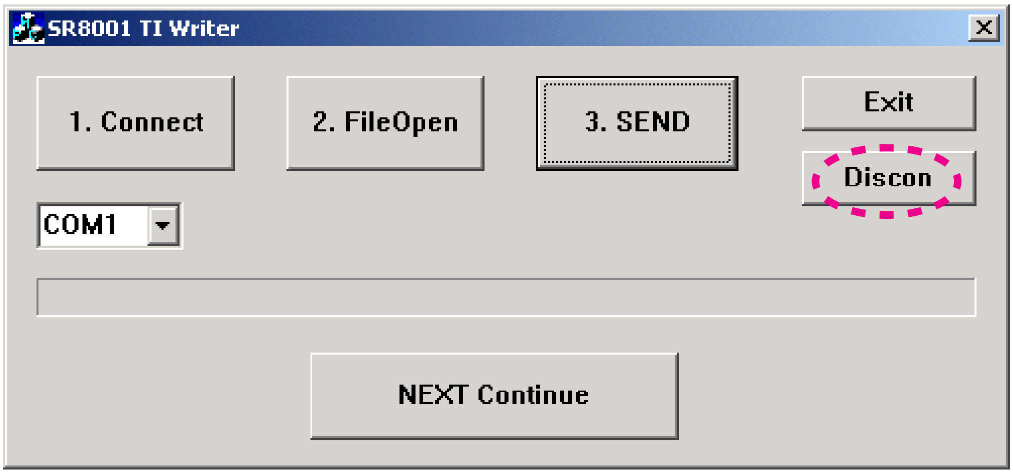
18. Click the **OK**.

18. **OK**をクリックします。



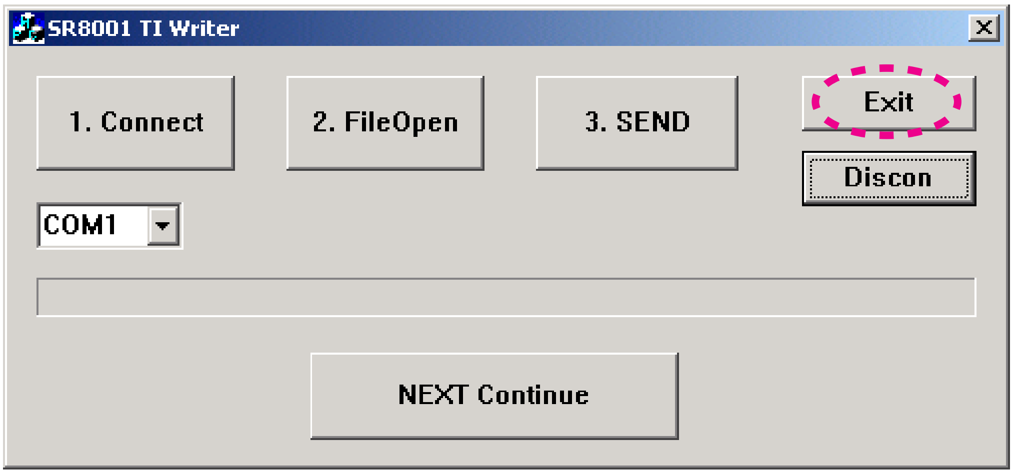
19. Click the **Discon**.

19. **Discon**をクリックします。



20. Click the **Exit**.

20. **Exit**をクリックします。



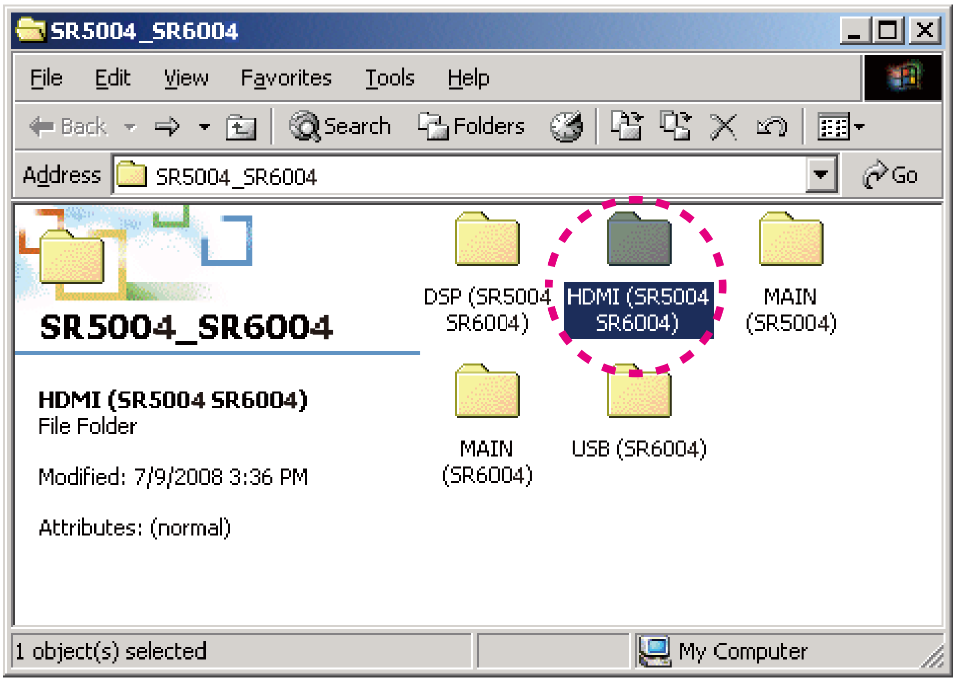
21. Press the **POWER ON/OFF** button for turn off the unit. (Except /F B, /U1B)
22. Disconnect the mains cord.
23. Disconnect the RS-232C cable from the unit.

21. **POWER ON/OFF**ボタンを押し、本機の電源を切ります。(/F B, /U1Bを除く)
22. 本機から電源コードを外します。
23. 本機からRS-232Cケーブルを外します。

Mode 3 : Update/Download HDMI CPU's software to internal Flash-ROM.

Update/Download Software for HDMI CPU (Mode 3)

1. Put the "HDMI (SR5004 SR6004)" folder into anywhere on your PC's hard disc.



2. Connect the RS-232C on rear panel of the unit and the Serial Port of windows PC with RS-232C cable.
3. Connect the mains cord into the unit.
4. Press the **POWER ON/OFF (STANDBY)** button for turn on the unit.
5. Press the **ENTER**, **CLEAR** and **BAND** buttons simultaneously more than 3 seconds to turn the unit into Loading Mode.
6. The FLD shows "SELECT MAIN" after showed "LOADING MODE".
7. Turn the **INPUT SELECTOR** to change display from "SELECT MAIN" to "SELECT HDMI" on FLD.
8. Press the **ENTER** button.
9. "SELECTED : HDMI" shows on the FLD.

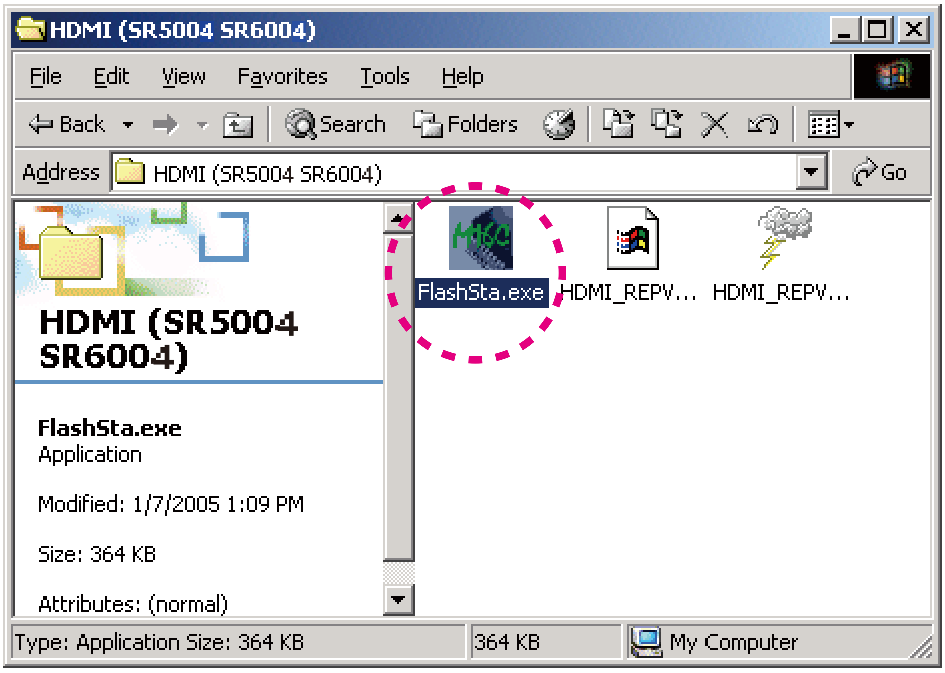
Mode 3 : Update/Download HDMI CPU's software to internal Flash-ROM.

Update/Download Software for HDMI CPU (Mode 3)

1. "HDMI (SR5004 SR6004)"フォルダをPCの任意のフォルダにコピーします。
2. 本機のリアパネルにあるRS-232CコネクタとWindows PCのSerialポートをRS-232Cケーブルで接続します。
3. 本機に電源ケーブルを差します。
4. **POWER ON/OFF (STANDBY)**ボタンを押し、本機の電源を入れます。
5. **ENTER, CLEAR, BAND**の3つボタンを同時に3秒以上押し続け、本機をローディングモードにします。
6. FLに"LOADING MODE"と表示された後、"SELECT MAIN"と表示されます。
7. 本機の**INPUT SELECTOR**を回して、FLの表示を"SELECT MAIN"から"SELECT HDMI"に換えます。
8. **ENTER**ボタンを押します。
9. FLに"SELECTED : HDMI"と表示されます。

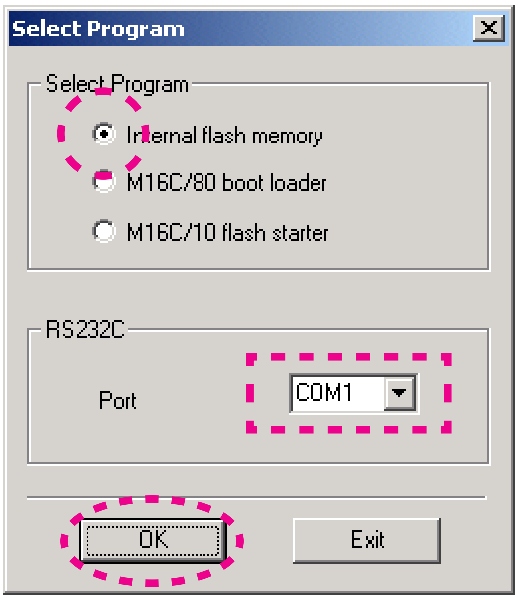
10. Double click the FlashSta.exe. And launch the M16 Flash Start.

10. FlashSta.exeをダブルクリックし、M16 Flash Startを起動します。



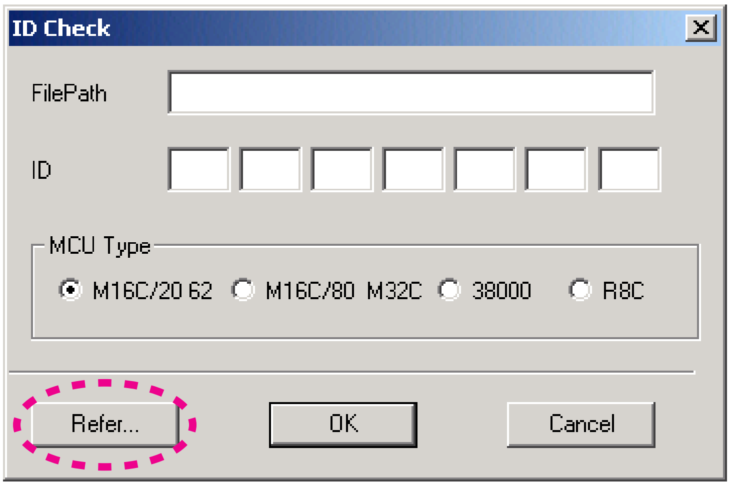
11. Check the **Internal flash memory** in the Select Program.
Choose the **COM Port number**.
And click the **OK**.

11. Select Programの**Internal flash memory**にチェックをして下さい。
使用する**COMポート番号**を選択します。
OKをクリックします。



12. Click the **Refer...**.

12. **Refer...**をクリックします。

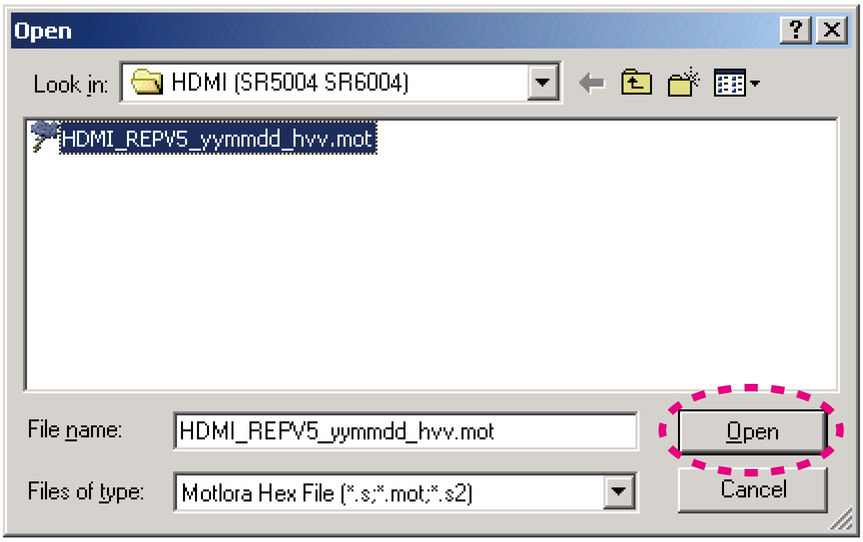


13. Choose the HDMI_REPV5_yymmdd_hvv.upd. And click the **Open**.

NOTE : The yy is two digits of year. The mm is month. The dd is date. The vv is release number.

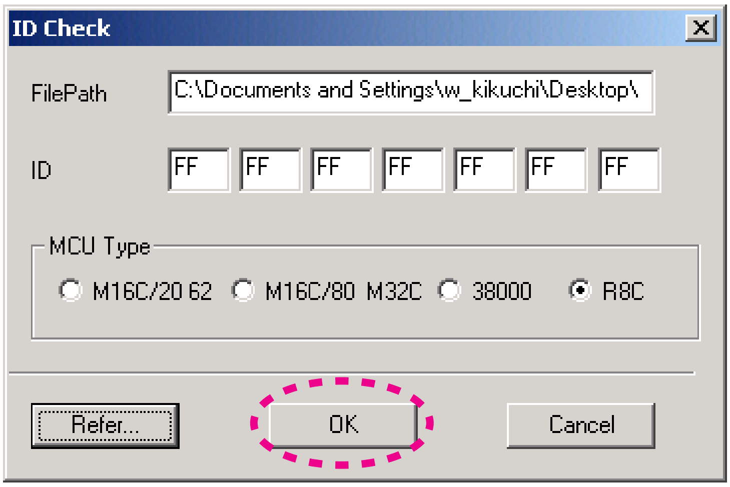
13. HDMI_REPV5_yymmdd_hvv.updを選択し、**Open**をクリックします。

注意 : yyは年の下二桁、mmは月、ddは日、vvはリリース番号



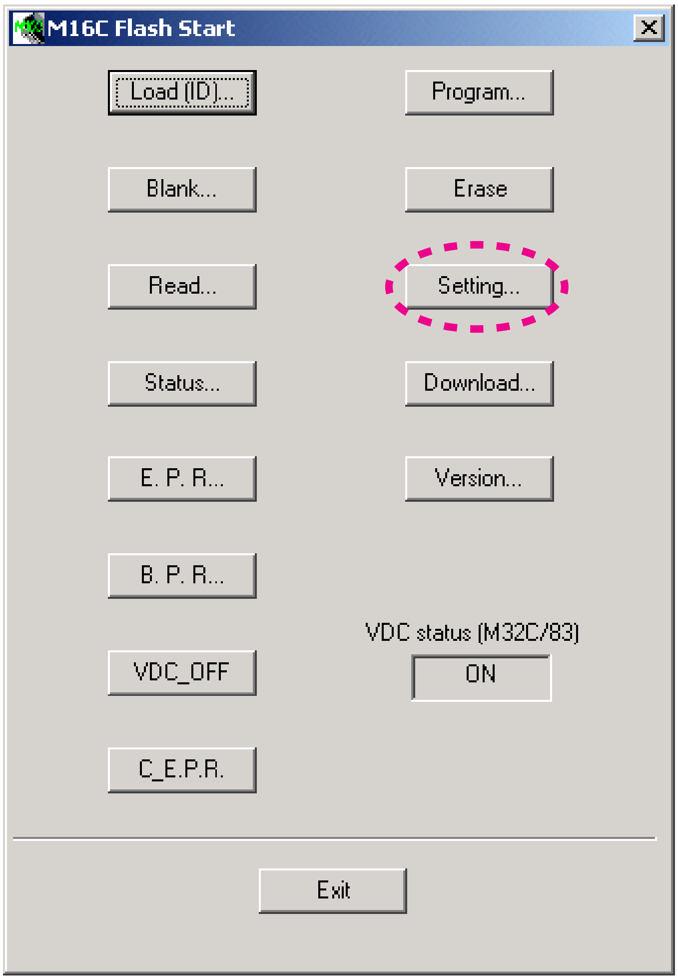
14. The FilePath and ID are inputted automatically, and the MCU Type is selected to R8C automatically.
Click the **OK**.

14. FilePathとIDは自動的に記入され、MCU TypeはR8Cが選ばれます。
OKをクリックします。



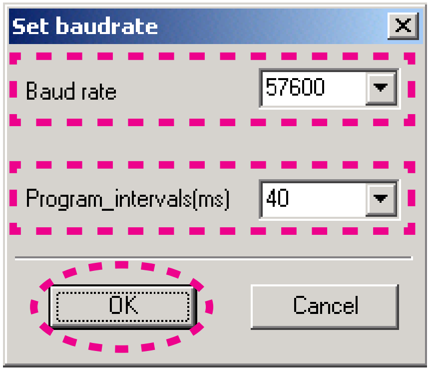
15. Click the **Setting...**.

15. **Setting...**をクリックします。



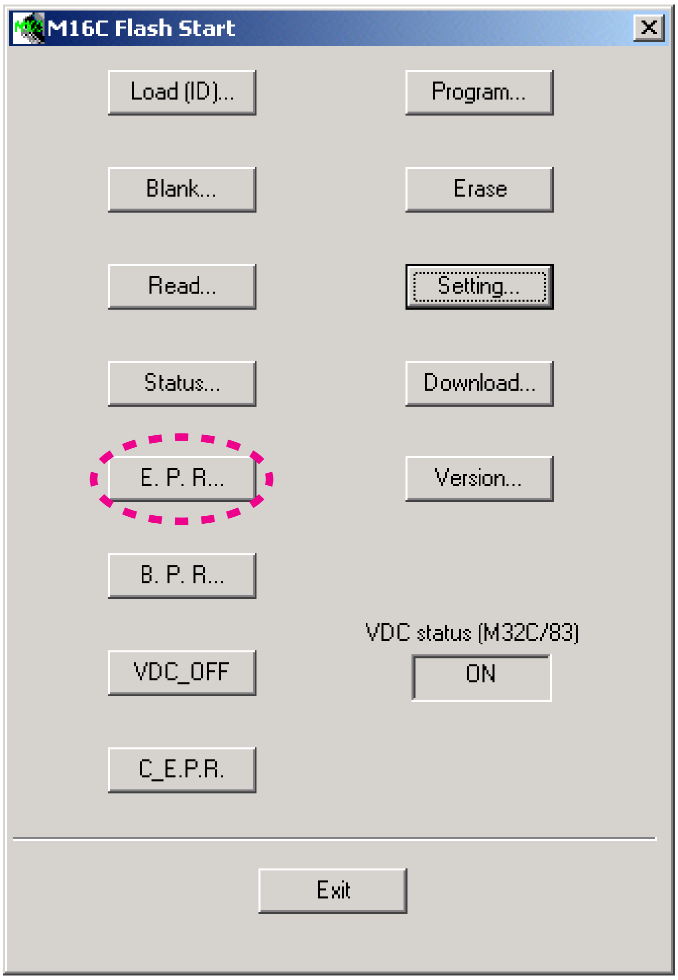
16. Choose the **57600** in the Baud rate.
Choose the **40** in Program_intervals(ms).
Click the **OK**.

16. Baud rateから**57600**を選択します。
Program_intervals(ms)を**40**にします
OKをクリックします。



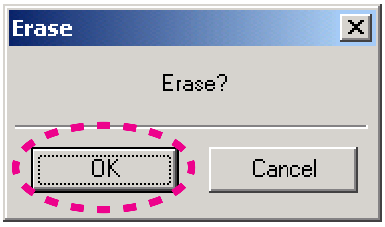
17. Click the **E.P.R...**.

17. **E.P.R...**をクリックします。



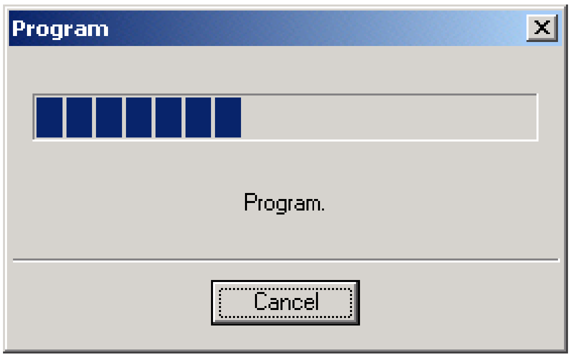
18. Click the **OK**.

18. **OK**をクリックします。



19. Software is written into the internal Flash-ROM of HDMI CPU.
The writing of software takes about 1 minute.

19. ソフトウェアがHDMI CPUの内部フラッシュROMに書き込まれます。
書き込みにかかる時間は約1分です。



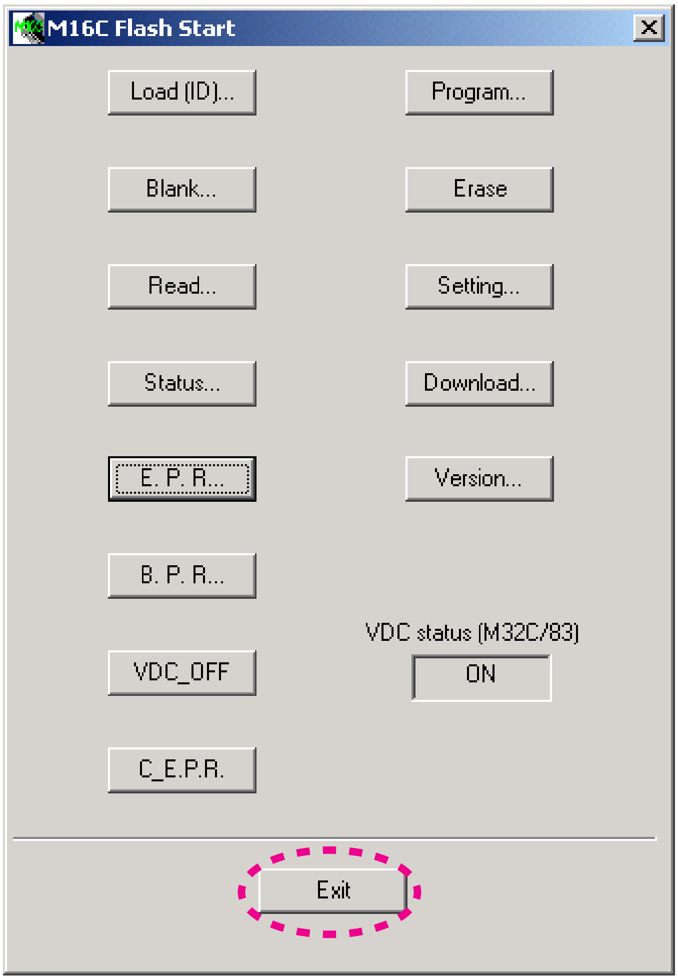
20. Click the **OK**.

20. **OK**をクリックします。



21. Click the **Exit**.

21. **Exit**をクリックします。



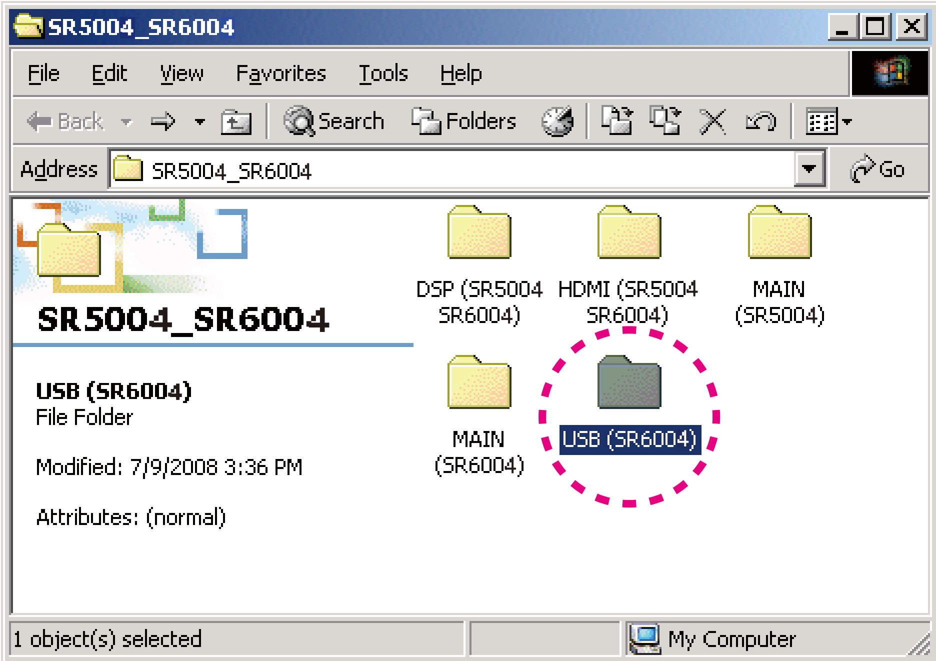
22. Press the **POWER ON/OFF** button for turn off the unit. (Except /F B, /U1B)
23. Disconnect the mains cord.
24. Disconnect the RS-232C cable from the unit.

22. **POWER ON/OFF**ボタンを押し、本機の電源を切ります。(/F B, /U1Bを除く)
23. 本機から電源コードを外します。
24. 本機からRS-232Cケーブルを外します。

Mode 4: Update/Download USB CPU's software to internal Flash-ROM.

Update/Download Software for USB CPU (Mode 4)

1. Put the "USB (SR6004)" folder into anywhere on your PC's hard disc.



2. Connect the RS-232C on rear panel of the unit and the Serial Port of windows PC with RS-232C cable.
3. Connect the mains cord into the unit.
4. Press the **POWER ON/OFF** (**STANDBY**) button for turn on the unit.
5. Press the **ENTER**, **CLEAR** and **BAND** buttons simultaneously more than 3 seconds to turn the unit into Loading Mode.
6. The FLD shows "SELECT MAIN" after showed "LOADING MODE".
7. Turn the **INPUT SELECTOR** to change display from "SELECT MAIN" to "SELECT USB" on FLD.
8. Press the **ENTER** button.
9. "SELECTED: USB" shows on the FLD.

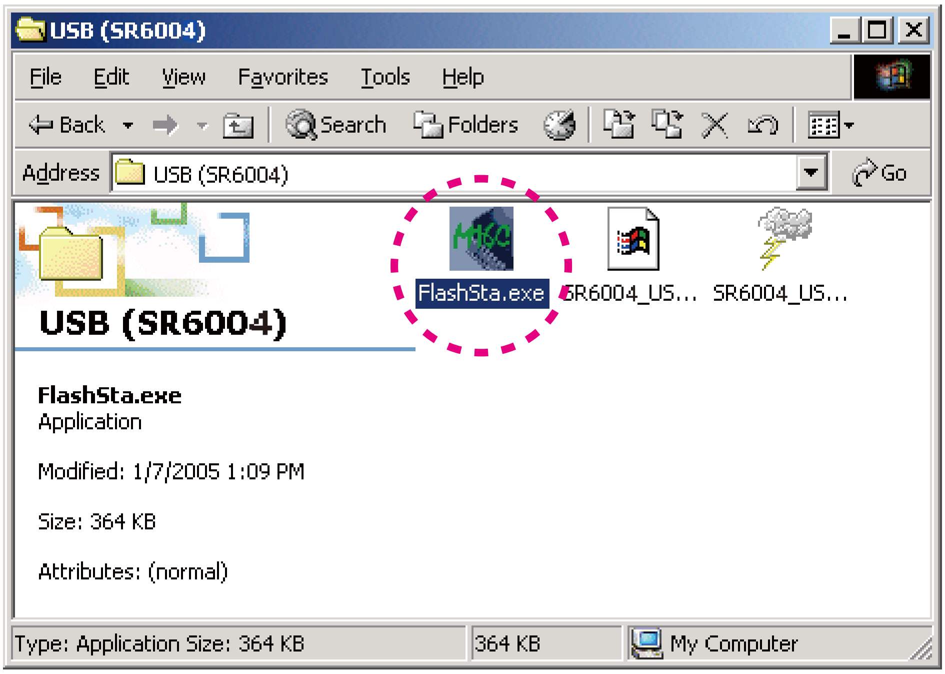
Mode 4: Update/Download USB CPU's software to internal Flash-ROM.

Update/Download Software for USB CPU (Mode 4)

1. "USB (SR6004)"フォルダをPCの任意のフォルダにコピーします。
2. 本機のリアパネルにあるRS-232CコネクタとWindows PCのSerialポートをRS-232Cケーブルで接続します。
3. 本機に電源ケーブルを差します。
4. **POWER ON/OFF** (**STANDBY**) ボタンを押し、本機の電源を入れます。
5. ENTER、CREAR、BANDの3つボタンを同時に3秒以上押し続け、本機をローディングモードにします。
6. FLに"LOADING MODE"と表示された後、"SELECT MAIN"と表示されます。
7. 本機のINPUT SELECTORを回して、FLの表示が"SELECT MAIN"から"SELECT USB"に換えます。
8. ENTERボタンを押します。
9. FLに"SELECTED: USB"と表示されます。

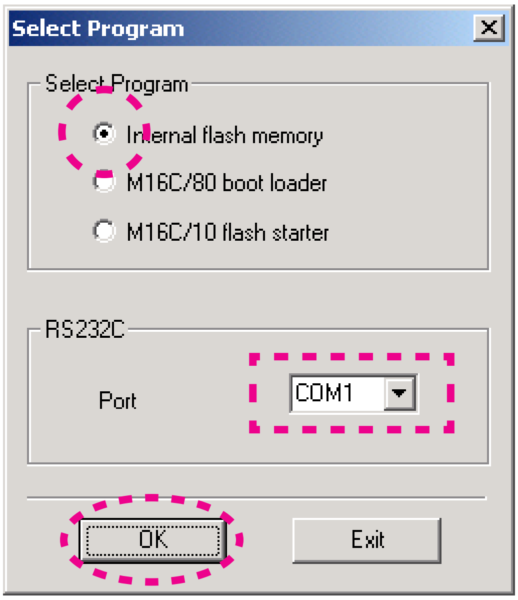
10.Double click the FlashSta.exe. And launch the M16 Flash Start.

10.FlashSta.exeをダブルクリックし、M16 Flash Startを起動します。



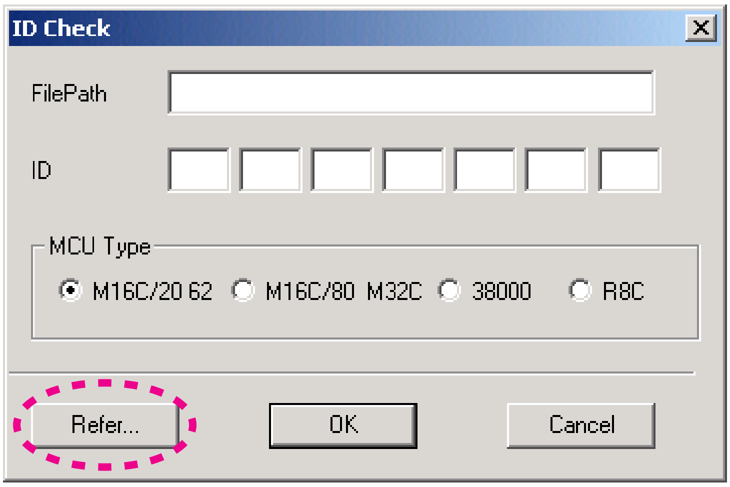
11.Check the **Internal flash memory** in the Select Program.
Choose the **COM Port number**.
And click the **OK**.

11.Select Programの**Internal flash memory**にチェックをして下さい。
使用する**COMポート番号**を選択します。
OKをクリックします。



12.Click the **Refer...**.

12.**Refer...**をクリックします。

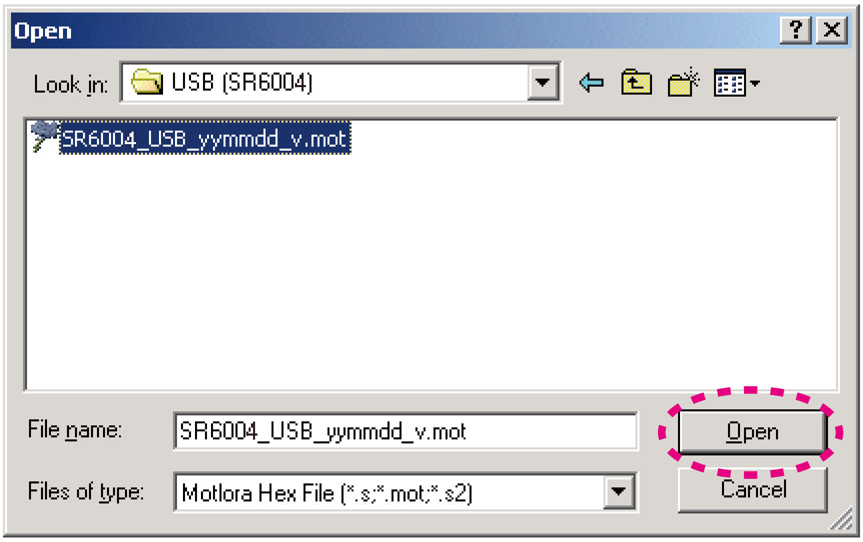


13.Choose the SR6004_USB_yymmdd_v.mot. And click the **Open**.

NOTE : The yy is two digits of year. The mm is month. The dd is date. The v is release number.

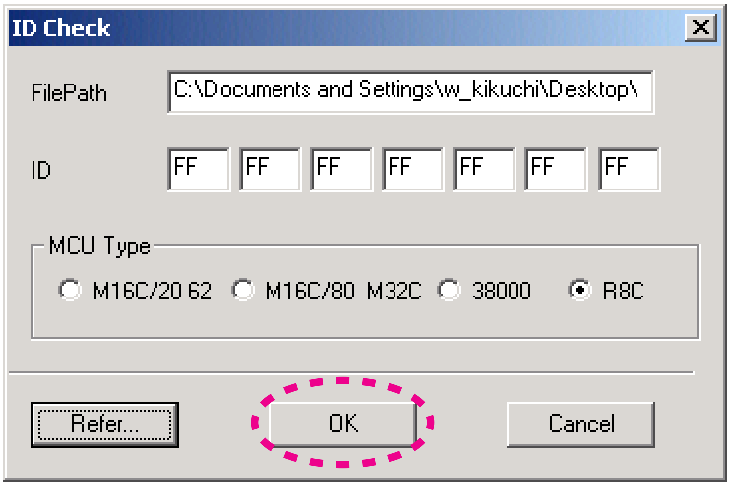
13.SR6004_USB_yymmdd_v.motを選択し、**Open**をクリックします。

注意 : yyは年の下二桁、mmは月、ddは日、vはリリース番号



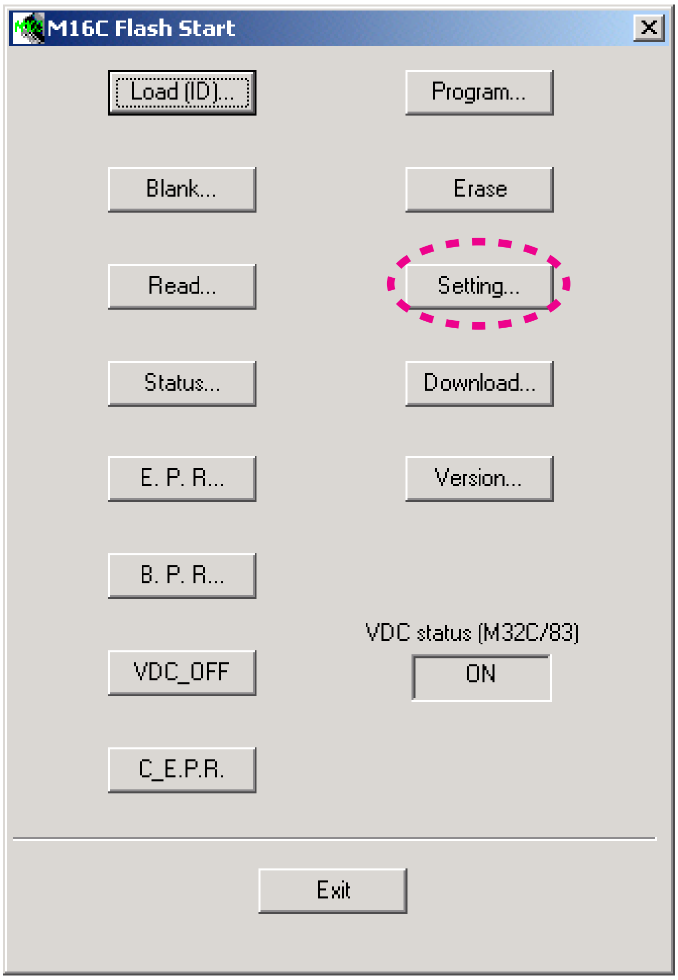
14.The FilePath and ID are inputted automatically, and the MCU Type is selected to R8C automatically.
Click the **OK**.

14.FilePathとIDは自動的に記入され、MCU TypeはR8Cが選ばれます。
OKをクリックします。



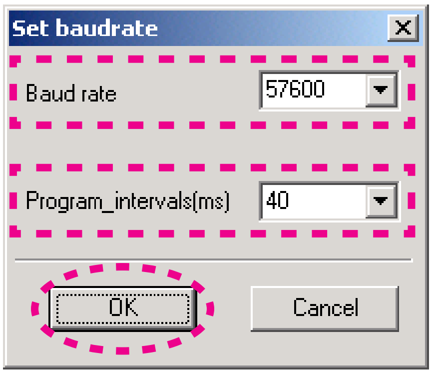
15.Click the **Setting...**.

15.**Setting...**をクリックします。



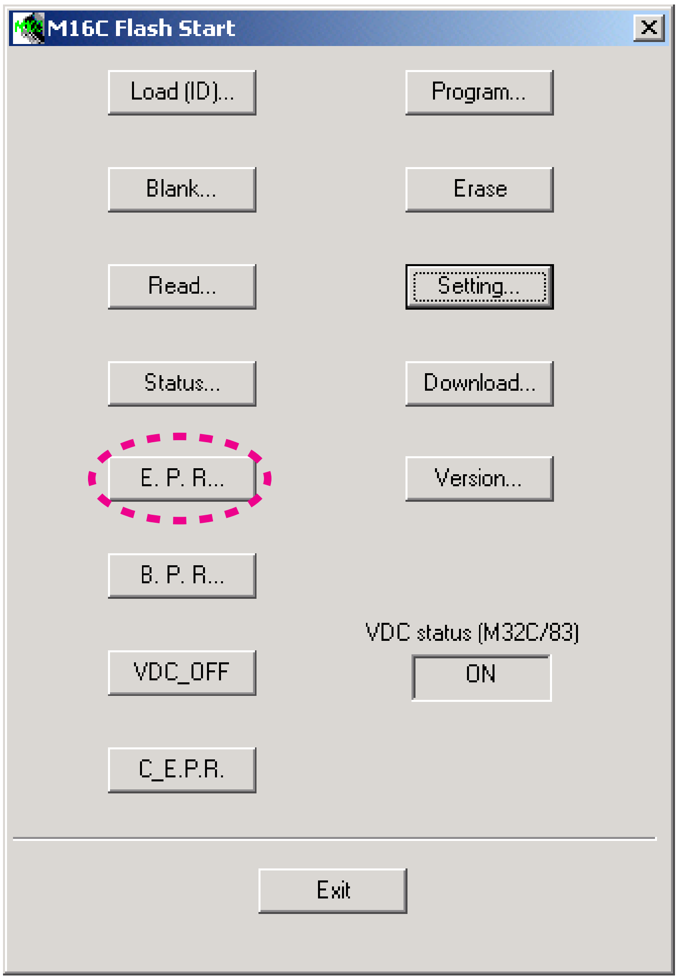
16.Choose the **57600** in the Baud rate.
Choose the **40** in Program_intervals(ms).
Click the **OK**.

16.Baud rateから**57600**を選択します。
Program_intervals(ms)を**40**にします
OKをクリックします。



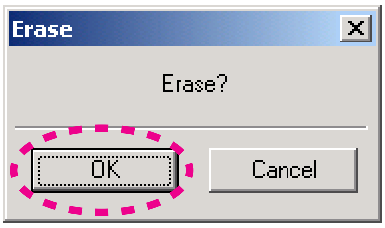
17.Click the **E.P.R...**.

17.**E.P.R...**をクリックします。



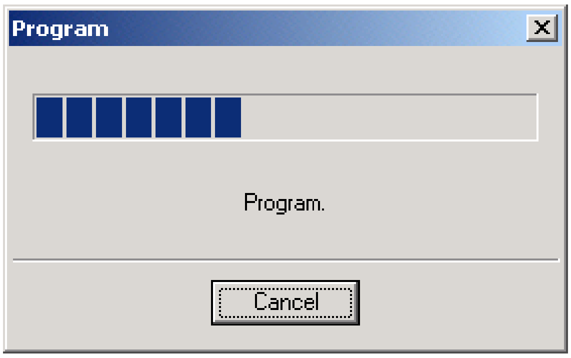
18.Click the **OK**.

18.**OK**をクリックします。



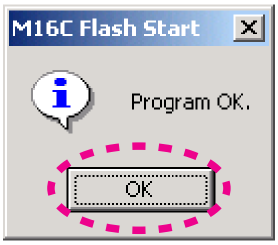
19.Software is written into the internal Flash-ROM of USB CPU.
The writing of software takes about 1 minute.

19.ソフトウェアがUSB CPUの内部フラッシュROMに書き込まれます。
書き込みにかかる時間は約1分です。



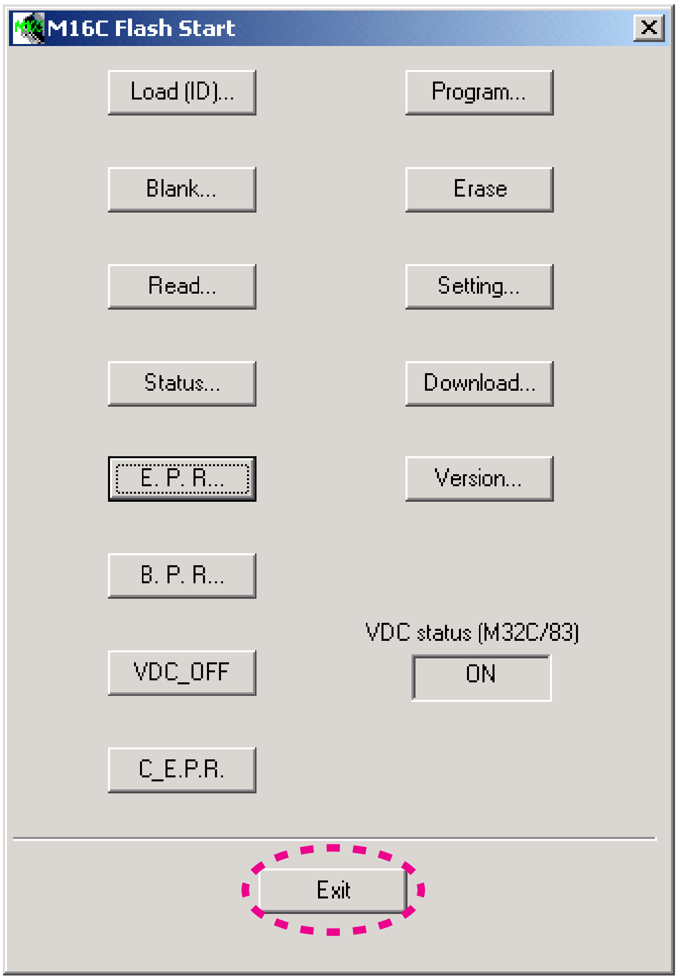
20.Click the **OK**.

20.**OK**をクリックします。



21.Click the **Exit**.

21.**Exit**をクリックします。



22.Press the **POWER ON/OFF** button for turn off the unit.
(Except FB and U1B)

23.Disconnect the mains cord.

24.Disconnect the RS-232C cable from the unit.

22.**POWER ON/OFF**ボタンを押し、本機の電源を切ります。
(FBとU1Bを除く)

23.本機から電源コードを外します。

24.本機からRS-232Cケーブルを外します。